TEXTILE TECHNOLOGY DIGEST

VOLUME 4 JULY 1947 NUMBER 7

Abstracts

ORGANIC FIBERS I

Fiber swelling. Some comparative data on cross-sectional swelling of textile fibers. Frederick F. Morehead, Am. Viscose Corp. *Textile Research J. 17,* 96-8 (Feb. 1947).

Cross sections 10μ thick are prepared by the paraffin method. For the dry-area measurements, the sections are conditioned in the laboratory, mounted in *n*-heptane or other nonswelling media, and a selected field is photographed. The *n*-heptane is then allowed to evaporate, is replaced by water, and the same field is photographed wet. The area was determined either with a planimeter or by cutting out and weighing the photographic images. Data for cross-sectional swelling (in %) are given for animal fibers, synthetic polymer fibers, natural cellulose fibers, rayons, and viscose rayon treated with various resins. Results are also given for the effect of denier per filaments on swelling. TTD: 7-47

Fibers. Textile fibers—engineering approach to understanding of their properties and utilization. Harold DeW. Smith. *Can. Chemistry & Process Industries 28,* 784 (Oct. 1944).

It is emphasized that the mechanical behavior of fibers should be realized and also that fibers can be designed to meet specific textile needs. TTD: 7-47

Newer fibers. Newer fibers. Paul Larose, Natl. Research Council (Ottawa). *Can. Chemistry & Process Industries 29,* 476-9 (1945).

Newer fibers such as the protein-derived Lanital, Aralac or Ardil, and nylon, Fortisan, Vinyon, and glass are discussed and compared with natural fibers. Also, the properties which determine the suitability of synthetic fibers for use in textiles are discussed, with special emphasis on molecular structure. TTD: 7-47

Wool and rayon fibers. Introduction to textiles for students, consumers, retailers, and wholesalers. W. G. Byerley. *Textile J. Australia 21,* 832, 834, 846-9 (Feb. 1947).

The manufacture of acetate rayon, regenerated protein fibers and alginate fibers is briefly described. Rayon staple fiber production, including its origin in Germany, and the viscose process of manufacturing tow are also discussed. In a brief general discussion of wool fiber, the various breeds of sheep and types of wool are considered and felting properties briefly explained. Factors in judging wool quality are considered with the aid of a table showing quality number, fiber diameter, and denier.

ELW TTD: 7-47

THE NEW FIBERS. Jos. V. Sherman, Herbert R. Simonds & Signe L. Sherman. D. Van Nostrand Co., Inc., New York, N. Y.; 1946; 552 pp.; price $5.00.

Reviewed in *Textile Research J. 17,* 340-41 (June, 1947). (*Cf.* TTD: *3,* 161.) TTD: 7-47

Vegetable fibers I 1

Cotton terminology. What the raw-cotton man means when he says. . . . Harris P. Smith, Texas A & M College. *Textile World 96,* No. 12, 224, 226, 228 (Dec. 1946).

A review of definitions of cotton trade terms including agricultural, grading, testing and the like. TTD: 7-47

Fiber decortication. Eric L. Lundgren (to Ox Fibre Brush Co., Inc.). USP 2 423 425, July 1, 1947.

A machine for the decortication of fibrous materials of the cabbage palmetto or the like consists of 2 sets of holding belts, a set of turning belts and 2 pairs of cylinders. The material is fed into one set of holding belts where it is acted upon by one pair of cylinders. It then passes through the turning belts which feed it to a second set of holding belts. Here it is acted upon by the second pair of cylinders. The cylinders are spiked and the material is completely shredded during its progress through the machine.

SPH TTD: 7-47

Flax and hemp. Our flax and hemp industries. Brittain B. Robinson, USDA Agricultural Research Administration. *Chemurgic Digest 6,* 241, 243-7 (Aug. 30, 1947).

The history, trends, and future of the industries are discussed in some detail. Because of high processing

costs, there is little hope for the future expressed.
LCL TTD: 7-47

Ramie. Old fiber with a future. Eric Morrell. *Nation's Business 35,* No. 1, 79-80 (Jan. 1947).

The use of ramie in a number of different ways, such as for summer clothing, is considered a good possibility.
TTD: 7-47

COTTON QUALITY STATISTICS, U. S. 1945-46. Anon. Pamphlet of USDA Production and Marketing Administration; 1946; 62 pp. TTD: 7-47

ENVIRONMENTAL MODIFICATION OF FIBER PROPERTIES AS SOURCE OF ERROR IN COTTON EXPERIMENTS. D. M. Simpson & K. L. Hertel. Pamphlet of USDA Plant Industry, Soils, and Agricultural Eng. Bur.; 1946; 15 pp.; price 10¢; (from *J. Agr. Research 73,* No. 3, 97-111, Aug. 1, 1946). May be obtained from Supt. of Documents, U. S. Government Printing Office, Washington, D. C.
TTD: 7-47

FIBER AND SPINNING PROPERTIES OF COTTON, WITH SPECIAL REFERENCE TO VARIETAL AND ENVIRONMENTAL EFFECTS. H. D. Barker & E. E. Berkley. USDA Plant Industry, Soils, and Agricultural Eng. Bur. Tech. Bull. 931; 1946; 36 pp.; price 10¢. May be obtained from Supt. of Documents, U. S. Government Printing Office, Washington, D. C.
TTD: 7-47

FLAX, HEMP, AND JUTE YEARBOOK, 1946-47. Anon. H. R. Carter Publications, Ltd., 17 Linenhall St., Belfast; 101 pp.; price 10s.

Reviewed in *Textile J. Australia 22,* 55 (Mar. 1947).
TTD: 7-47

STUDY OF EFFECT OF FERTILIZERS ON VARIOUS CHARACTERS OF THE COTTON PLANT. H. B. Brown. Bull. No. 406 of Agricultural Expt. Station, University, La.; 1946; 48 pp. TTD: 7-47

Animal fibers I 2

Absorption by wool. Absorption of acids and salts by wool. Paul Larose & R. Donovan, Natl. Research Council (Ottawa). *Can. Chemistry & Process Industries 31,* 646 (July, 1947).

Previous work on the mechanism of absorption by wool, now extended to salt solutions, which are being studied under a wide range of temperatures, is briefly reviewed. Preliminary experiments have been carried out with HCl, NaCl, KCl, $CaCl_2$ and NH_4Cl at room temperature. Absorption for short periods of time and comparatively concentrated solutions has shown that

the amount of salt taken up by the wool is practically proportional to the concentration of the solution and is the same for all 4 salts when expressed as equivalents of the salt absorbed. TTD: 7-47

Animal hair fibers. Introduction to textiles for students, consumers, retailers, and wholesalers. IV. W. G. Byerley. *Textile J. Australia 22,* 46-8 (Mar. 1947).

The animal hair fibers, such as Alpaca, camel, cashmere, mohair, rabbit hair, and Vicuna are briefly discussed. The production of silk and some of the characteristics of its fibers and filaments are considered in some detail.
ELW TTD: 7-47

Mohair. Origin, characteristics, and uses of mohair fiber. A. C. Whitford. *Textile Age 11,* No. 2, 57-60 (Feb. 1947).

The history of the Angora goat and its introduction into the U. S. are reviewed. Today production of mohair is the greatest in the United States. The grades of the fiber, microscopic details and uses are also reviewed.
TTD: 7-47

Silk throwing. Silk throwing requires layout changes. Saml. J. Miller. *Textile World 96,* No. 12, 123 (Dec. 1946).

Throwing plants for silk now have problems of plant layouts and equipment allocations, with the change-over from rayon. A table of spindle allocations for production control is given. TTD: 7-47

Wool. AATCC research has aided wool chemistry. N. D. Marius. *Textile World 96,* No. 12, 112-14, 215-16 (Dec. 1946).

By studying the chemistry of the wool fiber, finishing and dyeing processes have been improved. The microscope, x-ray, and the recently developed dyeometer have been used to great advantage in these studies. Research on scouring, carbonizing, and shrink-proofing is discussed. Many advances are expected in the future.
TTD: 7-47

Wool stains. Dip stains on hosiery wools. W. Davis. *Textile J. Australia 22,* 18 (Mar. 1947); reprinted from *Hosiery Trade J.*

The practice of dip-staining, or bloom-dipping, of fleeces (largely prevalent in England and Scotland) is noted as materially reducing the price of wool to the farmer. This practice is resorted to, in connection with the sale of wether sheep, frequently to cover up irregularity and poor quality in the fleeces; it is not found in Australia.
TTD: 7-47

Wool structure. Investigation of wool by electron microscope. Bertil Olofsson. *Proc. Swed. Inst. Textile Research* No. 2, 3-14 (1946); *in English.*

In a discussion of the examination of wool fibers by use of the electron microscope it is emphasized that the main problem is to get the matter sufficiently dispersed but yet avoid uncontrollable destruction. Mechanical and chemical methods of preparation are described. Results tend to show that the electron microscope ought not to be regarded as a decisive but as a complementary instrument of investigation in this field. TTD: 7-47

Artificial fibers I 3

Acetate rayon properties. Spinning process for production of artificial fibers. Arnulf Sippel. *Z. Electrochemie 50,* 256-66 (Nov.-Dec. 1944), *in German.*

Orientation and mechanical properties of acetate rayon fibers are determined. TTD: 7-47

Caseins. Know your caseins. II. Geo. H. Brother. *Plastics 5,* No. 5, 58, 60, 76-8 (Nov. 1946).

Applications in finishes, adhesives, paints (as a base), etc. are briefly reviewed (*cf.* TTD: *4,* 40). TTD: 7-47

Cellulose acetate. Theory of spinning process in production of artificial fibers, especially stretch spinning of cellulose acetate. Arnulf Sippel. *Z. Electrochemie 50,* 152-63 (June-July, 1944); *in German.*

Stretch spinning in a precipitating bath was analyzed mathematically. The variables in the equation were drawing velocity, stretch-spinning (in a precipitating bath), radius of the fiber pores, thread number, stretch and concentration of the spinning solution. TTD: 7-47

Rayon staple processing. Processing rayon staple on standard machinery. Wm. Hardacre, Courtauld's, Ltd. *Textile J. Australia 22,* 30, 32, 34-5, 56 (Mar. 1947); reprinted from *Papers of AATT.*

The versatility of rayon staple and its adaptability for processing on all systems of machinery are briefly considered. Because it is free from impurities, uniform in staple length, quality, and diameter, rayon staple need not go through the preliminary operations required for natural fibers. TTD: 7-47

Viscose fiber structure. Investigation of fine structure of freely coagulated viscose fibers by means of optical and electron microscope. M. Horio, K. Kobayashi & T. Kondo, Kyoto Imperial Univ. *Textile Research J. 17,* 264-80 (May, 1947).

Viscose was extruded from an ordinary spinneret and was coagulated freely without being stretched. The washed filaments were then embedded in paraffin and

sectioned. The sections were dyed with Oxamine Blue 4RX and examined by direct and polarized light, by dark field illumination, and with an electron microscope of the electrostatic type. The skin is formed regardless of whether the filament is stretched. The coagulation of viscose is a typical Liesegang effect. The cause of skin formation and the formation of alternate layers is explained. TTD: 7-47

Conditioning cellulose threads. Hayden B. Kline & Kenneth M. McLellan (to Ind. Rayon Corp.). USP 2 421 624, June 3, 1947.

Extremely high stretches are imparted to the thread without adversely affecting its quality by first moistening the thread to increase its plasticity and then subjecting it to a series of stretching operations. Thread of high tensile strength is produced in this way. TTD: 7-47

Viscose spinning. Hayden B. Kline, Alden H. Burkholder & Wm. O. Israel (to Ind. Rayon Corp.). USP 2 422 021, June 10, 1947.

A surface-active, long-chain polyoxyhydrocarbon polymer and an anion-active substance are incorporated in the viscose or in the coagulating bath to selectively wet deleterious particles to prevent them from sticking to each other and to the spinneret, and to act as a dispersing agent. The selective wetting agent is preferably oily, soluble in the coagulating liquid, and should form a film over the insoluble particles which tend to form spinneret deposits or on the surface of the spinneret where deposits tend to form. TTD: 7-47

Alginate filaments. Ernest E. Tallis (to Courtaulds, Ltd.). USP 2 422 993, June 24, 1947.

Alginate threads which do not adhere to each other are produced by spinning a solution of sodium alginate into a solution containing an alkaline-earth salt, such as $CaCl_2$, a small amount of a cation-active compound, such as cetyl pyridinium chloride, and a small proportion of an organic acid, such as AcOH. No free mineral acid should be present. The threads are collected in a centrifugal spinning box. TTD: 7-47

Alginate filaments. Ronald B. Hall (to Courtaulds, Ltd.). USP 2 423 075, June 24, 1947.

Speakman (see TTD: *2,* 164) patented a process for coating alginated yarns with oils in the coagulating bath to prevent them from sticking together. However, when the thread is collected in helices, oil causes the threads to run together. Good results can be obtained by treating the thread, in the absence of oil, with a solution containing a small amount of a cationic or nonionic wetting agent, such as lauryl pyridinium sulfate, cetyl pyridinium chloride, and compounds obtained by the action of ethylene oxide on an aliphatic alcohol or acid containing more than 8 C atoms in a chain. TTD: 7-47

Bucket spinning guide. Seddon C. Nelson (to Am. Viscose Corp.). USP 2 423 721, July 8, 1947.

In the process of bucket spinning of continuous filaments the yarn passes down through a funnel mounted on the axis of the centrifugal pot. The rotation of the pot sets up a vibration in the yarn which forms a small balloon. To overcome this objection a funnel has been designed with 4 projections formed on the inside of the funnel tube which project beyond the axis of the tube. Two of these projections are in one plane and 2 are at right angles to the plane. These projections restrict the motion of the yarn and eliminate the vibration.
SPH TTD: 7-47

Casein fiber hardening. Rudolf Signer. Can. P. 440 858, Apr. 22, 1947.

Fibers dry-spun from alkaline caseinate are first treated chemically, with formaldehyde and acid, for example, then mechanically, by elongating, for example, and then with a chrome bath. TTD: 7-47

Cellulose acetate. Lawrence B. Steele, Jr. (to Can. Industries, Ltd.). Can. P. 440 893, Apr. 22, 1947.

A tough, dense fibrous structure is made of at least 50 wt.% of long, randomly distributed, crinkled filaments of thermoplastic organic material, 5-20 denier in size. The material is translucent up to ¼" thickness and can be cut, shaped, drilled, tapped and machined. Acetone-soluble cellulose acetate is specifically claimed as the filamentous material. TTD: 7-47

Cellulose ester textile. John G. Williams & Leonard Krause (to Henry Dreyfus). Can. P. 441 117, Apr. 29, 1947.

A textile material with a very low wet strength and a substantial dry strength is made from an organic ester of cellulose by treating it with an aqueous solution of an acid which can saponify the ester and hydrolyze cellulose, then placing in air saturated with water vapor until the wet strength is reduced to a very low value.
TTD: 7-47

Synthetic fibers I 4

Nylon. Nylon yarn, its history and manufacture. H. C. Messerau, Can. Industries, Ltd. *Can. Chemistry & Process Industries 29,* 808-13 (1945).

Carothers' research on synthetic polyamide fibers, leading to the development of nylon, is discussed generally and the manufacturing process described in some detail.
TTD: 7-47

Plexon. Monofilament techniques may be applied

to Plexon. Anon. *Textile World 97,* No. 1, 143 (Jan. 1947).

The uses and properties of Plexon, a plastic coated yarn, are described with accompanying diagrams to show the construction of some of the fabrics. TTD: 7-47

Fiber applications I 5

COTTON IN PLASTIC LAMINATES. Giles E. Hopkins. Natl. Cotton Council of Am., Washington, D. C.; 1946; 28 pp.; free.

Reviewed in *Textile Research J. 17,* 341-2 (June, 1947). TTD: 7-47

INORGANIC FIBERS II

Glass fibers. Robt. I. Johns. USP 2 422 969, June 24, 1947.

A method of applying glass fibers to a backing material by means of adhesives is described. The product is used for wall panelling or trim, picture frames, around window displays, or for display lettering. TTD: 7-47

Asbestos fiber. Lee C. Pharo (to Johnson's Co.). USP 2 422 980, June 24, 1947.

Crushed and dried asbestos ore is screened to eliminate the rock and the spicules containing the longest fiber, and the remaining fiber is subjected to a classification step which allows the escape of extremely short fiber without injuring the long fibers. The product has good spinning and other textile qualities. TTD: 7-47

Impregnated glass fibers. Robt. S. Stevens & Irving E. Muskat (to Pittsburgh Plate Glass Co.). Can. P. 440 950, Apr. 22, 1947.

A sheet of fibrous glass fabric is impregnated with a resinous polymer containing at least 50% of a neutral ester of a dicarboxylic acid and 2 molecular equivalents of a monohydroxyl alcohol containing an olefine bond in an aliphatic carbon chain adjacent to the second C atom from the OH group. A number of sheets of glass fiber may be bonded together with the resin. TTD: 7-47

Glass fiber braiding. Arthur L. Parker (to Parker Appliance Co.). Can. P. 441 092, Apr. 29, 1947.

A flexible tube comprises an inner rubber tube surrounded by a sleeve of braided glass fibers and bonded to the rubber tube by an impregnating plastic coating.
TTD: 7-47

Glass yarn. Jas. F. Hyde (to Owens-Corning Fiberglas Corp. through Corning Glass Works). Can. P. 440 793, Apr. 15, 1947.

See USP 2 390 370, Dec. 4, 1945 (TTD: *3,* 57) and also Australian P. 122 036, Aug. 29, 1946. TTD: 7-47

ASBESTOS; THE SILK OF THE MINERAL KINGDOM. Oliver Bowles. Ruberoid Co., 502 5th Ave., New York, N. Y.; 40 pp.; free.

Reviewed in *Tech. Book Rev. Index 13,* 63 (Apr. 1947); from *Asbestos 37* (Feb. 1947). TTD: 7-47

FIBER TO YARN III

Fiber preparation III 1

Carding intensity. Working of the cotton card and its mathematical concepts. W. Oeser, Gladbach-Rheydt Research Inst. *Textile Research J. 17,* 382-4 (July, 1947).

A general equation for the number of wire points per inch to the inches of fiber spread on the cylinder (wire points/in. of fiber length) is derived from expressions for the number of revolutions of the cylinder for 1 in. fed by the feed roll, the ratio of the surface speed of the cylinder to the surface speed of the feed roll, the wire points per sq. in. of drawn-in lap, the wire points per oz. of lap, the number of fibers per sq. in. of lap, the number of wire points per fiber, and the wire points per in. of fiber length. TTD: 7-47

Cotton card. Whitin's new cotton card. Anon. *Am. Wool Cotton Reptr. 61,* No. 2, 42-3 (Jan. 9, 1947).

The "Model L" (Whitin Machine Works) is a new card briefly described and illustrated. TTD: 7-47

Card stripping. H. Goldsmith, Jr. (to Abington Textile Machinery Works). USP 2 422 011, June 10, 1947.

A vacuum card cylinder stripping device comprises an arrangement of parts which successively clears a small portion of the card cylinder in a systematic order so that at the completion of the cycle the entire cylinder surface has been cleaned. An arrangement of valves and manifolds controls the cycle of suction from the manifold. The process is continuous so that the card does not have to be stopped to be stripped.
SPH TTD: 7-47

Drawing. Ramón B. Solanas. USP 2 422 444, June 17, 1947.

This device consists of 1 pair each of feed, intermediate, slip and front rolls. In addition to the 4 pairs of rolls there is a conducting roller which rests on the lower roll of the second and third pairs. Under this conducting roller there is a condenser supported on a small wire bracket. Total drafts of up to 100 are claimed.
SPH TTD: 7-47

Card clothing. S. W. Dronsfield (to Dronsfield Bros.). Brit. P. 578 930. *Textile Mfr. 72,* 663 (Dec. 1946).

A portable unit with electric motor slowly rotates the cylinder or doffer of a carding engine when clothing is being applied.
PMS TTD: 7-47

Synthetic rubber cot. Edw. R. Rothermel (to Dayton Rubber Mfg. Co.). Can. P. 440 915-16, Apr. 22, 1947.

A cot for textile processing is made of a synthetic rubber compound provided with a plurality of voids or cells, uniformly distributed in it. This leaves a pitted or roughed surface as the cot wears down in use. The rubber may be butadiene copolymer with acrylic nitrile. Substances such as $NaHCO_3$, diazoaminobenzene, NH_4HCO_3, Na_2CO_3, $(NH_4)_2CO_3$ and mixtures of NH_4Cl and $NaNO_2$ are added to liberate gas which forms the voids. The method of mixing unvulcanized rubber cot stock with substances which gasify under conditions of vulcanization is claimed. TTD: 7-47

Spinning III 3

Broken end collector. Pneumatic cleaner and broken end collector for ring spinning frames. Anon. *Textile Recorder 64,* No. 767, 41-2 (Feb. 1947).

The Pneumafil system for cleaning ring spinning frames, whereby broken ends are drawn away by suction, thus dispensing with the usual underclearers, is briefly described and illustrated. TTD: 7-47

Converting mules. Converting mules to ring spinning. Anon. *Textile Recorder 64,* No. 767, 38-40 (Feb. 1947).

There are at least 2 important factors upon which conversion of mules to ring spinning should be predicated: the greater productive capacity of the ring spinning frame and the higher degree of skill needed for mule spinning, a particularly important factor in a difficult labor market. The conversion of 1 complete mule (patented by Jas. S. Heaton, H. H. Moulds & Arthur Williams, Atherton Mills, Ltd.) in a Lancashire mill is described in some detail and illustrated. The carriage of the converted mule is kept stationary up against the roller beam and the spindles, bolster, rail and spindle drive remain unchanged. Lappet thread guides are fitted and ring rails, of light metal alloy, built in sections of 14 spindles. The counts spun to date include 74s and 94s with a twist factor of 2.9. TTD: 7-47

Cotton sliver treatment. Studies of treatment of cotton in sliver form. I. Effect of Syton: spinning studies. Edw. A. Murray, John W. Moore & Simon Williams, Natl. Cotton Council & Univ. of Texas. *Textile Research J. 17,* 331-9 (June, 1947).

The application of Syton (colloidal silica dispersed in water) to cotton in the form of sliver has been found to

increase quite markedly the tensile strengths of yarns spun from the treated cotton. In all cases investigated, the skein strength of yarns from Syton-treated cotton, produced at the lowest twist multiple spinnable, exceeded the maximum strength of untreated cotton, spun at its optimum twist multiple, of the same variety and staple length. Although some strength was realized in spinning treated cotton at conventional twists, the greatest strength increases were always obtained at twists lower than those required for maximum strength in untreated cotton. Visual inspection of the yarns from Syton-treated cotton indicated that they were somewhat less uniform than those of untreated cotton, and this lack of uniformity was reflected in less producible, although uniformly high, skein strengths. TTD: 7-47

Jute spinning. Modern jute spinning. Flaxman. *Textile Recorder 64,* No. 767, 43-4, 57 (Feb. 1947).

A system of 2 drawings and a roving frame is described, with particular reference to the Eves patent high speed push-bar drawing frame (Douglas Fraser & Sons, Ltd.) which is equipped with semi-automatic roll former and double-banked roll feed. Comparison is made with earlier types of drawing frames (*e.g.,* rotary gill, chain gill, and screw gill), and it is pointed out that the Eves frame can effect a saving in floor space of perhaps 50% along with a reduction in power consumption and running cost. TTD: 7-47

Spinning rayon staple. Rayon staple's part in colored-woven revolution. Dan Duxbury. *Silk & Rayon 20,* 1194, 1197-8, 1201 (Oct. 1946).

Design in fabrics is developing, with the trend toward a greater variety of yarns. The influence of the spinner on design can be seen in the new effects that have been attained. TTD: 7-47

Spindle mounting. Seddon C. Nelson (to Am. Viscose Corp.). USP 2 421 389, June 3, 1947.

In a system of lubricating a ball-bearing-mounted spindle, a rotating cup mounted coaxially about the shaft and turning with it holds a supply of oil. When the cup rotates at a high speed the oil is thrown to the outside of the cup. A stationary disc mounted in the cup and having a passage from the edge to the center scoops up the moving oil and carries it to the center chamber. From this chamber the oil is carried to the bearings by a wick which surrounds the spindle.
SPH TTD: 7-47

Heat-dissipating cot. Alfred J. Maino. USP 2 421 426, June 3, 1947.

The surface of present textile rollers for spinning frames and the like become impacted and undesirably glazed because of the heat generated. By providing perforations

through the cot, the heat can be more readily dissipated.
SPH TTD: 7-47

Spinning frame stop motion. Gordon S. Fraser (to Douglas Fraser & Sons, Ltd.). USP 2 421 555, June 3, 1947.

A mechanical device consists of a detector, or feeler, held in place by the material, and a linkage which removes the pressure from the feed rolls when the material breaks and the feeler is displaced.
SPH TTD: 7-47

Spinning spindle. John A. Kennedy (to Saco-Lowell Shops). USP 2 421 734, June 3, 1947.

The standard spindle base is provided with a hollow, oil-tight bolster which carries a prefabricated, sealed ball bearing at top and bottom. Oil is provided in the space between the base and the bolster to dampen vibration. The arrangement eliminates the fluid friction between the spindle stem and the lubricating oil in the present mounting.
SPH TTD: 7-47

Ring spinning cops. Friedrich Preysch (to A. G. Joh. Jacob Rieter & Cie). USP 2 421 908, June 10, 1947.

A means whereby a tapered end may be added to a thread carrier sleeve and the spindle lowered as the package is built up, provides a longer package which contains more yarn and increases the length of time between doffs.
SPH TTD: 7-47

Cap spinning traveler. Ernest K. Bauer (to Am. Viscose Corp.). USP 2 423 678, July 8, 1947.

The skirt of the cap on a cap spinning frame is provided with a suitable track on which a traveler slides. There are 4 different designs of travelers including a ball-bearing-mounted rotating ring.
SPH TTD: 7-47

Ring doubling frame. Arthur Davenport. Can. P. 440 461, Apr. 1, 1947.

On a ring doubling frame a solid, one-piece pulley provided with a Y-shaped zig-zag groove carries yarn from the creel to the winding bobbins. TTD: 7-47

Strand plying. Seddon C. Nelson (to Am. Viscose Corp.). Can. P. 440 630, Apr. 8, 1947.

A plied strand is produced by twisting together 2 strands, wound side by side on a hollow core, with a third strand, the feed of the strands being maintained longitudinally to the doubling position at about the same speed.
TTD: 7-47

Winding — III 4

Warp beam cores. Small cores in warp beams are not unqualified benefit. R. J. Demartini, Gen. Electric Co. *Textile World 97,* No. 1, 133, 184, 186 (Jan. 1947).

Maximum efficiency is not attained by the use of small diameter cores in warp beams for winding yarns and fabrics. The actual volume of yardage does not increase in proportion to decreased core diameter and therefore gives no practical reason for operating with small centers. In addition, the cost of drives for the smaller cores is higher, crushing of inner layers of material is increased, strength of the beam is reduced, and there is a problem of alignment. TTD: 7-47

Winder. Wm. T. Stearn & Frank W. Schulte (to Camille Dreyfus). Can. P. 440 823, Apr. 15, 1947.

See USP 2 362 506, Nov. 14, 1944 (TTD: *1,* No. 6, 6). TTD: 7-47

Winder control. John H. Garrott (to Clark Thread Co.). Can. P. 441 056, Apr. 29, 1947.

See USP 2 390 703 (TTD: *3,* 63). TTD: 7-47

Yarn processing — III 5

Cotton yarn treatment. Colloidal silica increases strength of cotton yarns. Anon. *Textile Age 11,* No. 1, 78, 80-1 (Jan. 1947).

From test results (made by Natl. Cotton Council) increased strength was found to be imparted to cotton yarns by treating card or drawing sliver with Monsanto Syton (silica in colloidal dispersion). TTD: 7-47

Treating cellulose fibers. Howard M. Buckwalter (to U. S. Rubber Co.). USP 2 422 078, June 10, 1947.

The tensile strength of natural cellulose fibers is improved by treating yarns or cords made from the fiber with an aqueous solution of an alkali-metal salt of "run" native Congo copal resin by the process described in USP 2 297 536. TTD: 7-47

Yarn products — III 6

Cotton Tire Cord, Present and Future Use in Tires. Mason Dupré. Pamphlet of USDA Agricultural & Ind. Chemistry Bur. No. 130; 1946; 8 pp. TTD: 7-47

YARN TO FABRIC — IV

Fabric selection. How to choose a fabric. Alex. J. Bennett. *Textile J. Australia 22,* 14 (Mar. 1947).

Relatively simple methods of assessing the real value of woolen or worsted fabrics in general wearing apparel are suggested for the consumer.
ELW TTD: 7-47

Yarn preparation — IV 1

Slashing techniques. Can improve slashing, Georgia men say. Anon. *Textile World 96,* No. 12, 133, 135, 198, 200, 202 (Dec. 1946).

A round-table discussion of slashing techniques used by 18 Georgia mills with a table of substitutes or extenders to replace corn starch. TTD: 7-47

Warp sizing. Notes on gelatin for warp slashing. Anon. *Warp Sizing Specialist* (Sept. 1947).

A general discussion of gelatin as a warp size.
LCL TTD: 7-47

Weaving — IV 2

Weaving. Weights (in oz.) per square yard. G. Feher. *Textile J. Australia 21,* 820, 824-5 (Feb. 1947).

A table is given, with instructions for its use, which can be used to ascertain the weight of cloth from a given setting with given yarns, the setting necessary to obtain a certain weight with given yarns, and the counts of yarns to be used to obtain a given weight with a given setting.
ELW TTD: 7-47

Looms — IV 2 a

Loom fixing. Loom fixer's manual. Eugene P. Schremp. *Textile World 96,* No. 12, 151, *97,* No. 1, 222, 226 (Dec. 1946; Jan. 1947).

A maintenance note on the automatic filling motion, including feelers. TTD: 7-47

Loom take-up. Rayon-loom take-up requires careful adjustment. H. E. Wenrich. *Textile World 96,* No. 12, 218, 220 (Dec. 1946).

A review of the construction and adjustment of pick-wheel assemblies of rayon looms with an accompanying diagram. TTD: 7-47

Loom dobby. Jos. D. Cash, Jr. USP 2 421 599, June 3, 1947.

Bushings for the pivot points of dobby levers increase the wear resistance of their points.
SPH TTD: 7-47

Plastic shuttle. Paul B. Wilson (to Harold D. Wolgamot). USP 2 423 917, July 15, 1947.

A shuttle, the main body of which is molded of "Tenite" or a like plastic, is provided with wear strips of hard

wood at each of the 4 corners to prevent wear of the plastic. The shuttle eye and the metal shuttle heads are cast into the plastic. It is claimed that a better balanced shuttle can be produced more cheaply than the present wood shuttles.
SPH TTD: 7-47

Control devices IV 2 b

Loom reversing mechanism. Farrell V. Clarke (to Uxbridge Worsted Co., Inc.). USP 2 421 539, June 3, 1947.

A loom is provided with control means for certain parts whereby a power-driven means backs up certain loom parts. Heretofore when one or more filling threads are broken, it has been necessary to reverse the pattern-forming mechanism, or head, and also to back up the warp beam and the cloth beam manually before starting the loom again. The accuracy with which these parts are related depends upon the skill of the operator. This device provides a power-driven mechanical device to perform these operations.
SPH TTD: 7-47

Weft straightening. Leslie C. Nield (to Tootal Broadhurst Lee Co., Ltd.). USP 2 421 575, June 3, 1947.

The cloth passes through 2 sets of rollers disposed on the 2 selvedges of the cloth. These rollers produce a lateral pull on the cloth due to their angular position. When the weft threads are straight the width of the fabric is constant. If the weft threads are not at right angles to the warp, the lateral pull of the rollers causes the fabric to spread. This spreading causes an electric contact to be made which changes the speed of the rollers through a differential gear train. The speed of one set is increased while the speed of the other is decreased, thus straightening the cloth.
SPH TTD: 7-47

Weft detector. Richard G. Turner (to Crompton & Knowles Loom Works). USP 2 421 587, June 3, 1947.

A mounting frame is provided which allows for the removal of the feeling fingers on a warp detecting device with disassembling of the parts and spoiling of the adjustment.
SPH TTD: 7-47

Loom letoff. Oscar V. Payne (to Crompton & Knowles Loom Works). USP 2 421 961, June 10, 1947.

Warp used in weaving is generally wound on a beam rotatably mounted at the back of the loom. Power for turning this beam is usually supplied through the warp threads; but when the beam is of large diameter, its

weight imposes heavy strains on the warp and it is desirable to provide auxiliary means of turning the warp beam. A mechanism is provided whereby power may be supplied from some rotating shaft of the loom. When the tension in the warp increases it pulls the whip roll forward, which releases the brake and applies the power. As the tension is relieved, the whip roll moves back and releases the power and applies the brake.
SPH TTD: 7-47

Electric weft detector. Chas. B. Keenan (to Crompton & Knowles Loom Works). USP 2 422 911, June 24, 1947.

An insulated base having 2 detector fingers arranged to slide, and driven forward by means of flat springs, is mounted on the frame of the loom. The detector fingers contact a metal ferrule on the bobbin when the yarn has been removed. This contact closes an electrical circuit actuating the required mechanism, such as a stop motion or bobbin changing motion.
SPH TTD: 7-47

Loom shuttle. Emerson B. Tifft (to Draper Corp.). USP 2 423 421, July 1, 1947.

An adjustment for a loom shuttle of the type which has a spindle to carry the filling bobbin aligns the spindle with the shuttle eye to prevent excessive filling breakage.
SPH TTD: 7-47

Bobbin receiver. Richard G. Turner (to Crompton & Knowles Loom Works). USP 2 423 667, July 8, 1947.

An adjustable chute may be attached to bobbin changing looms which directs the empty bobbin, in general, downward and outward into the mouth of the receiver.
SPH TTD: 7-47

Fabric construction IV 2 c

Rayon cord fabric. Rayon Bedford cord fabric analyzed for production. Anon. *Am. Wool Cotton Reptr. 61,* No. 1, 7-8, 32 (Jan. 2, 1947).

From an analysis of a Bedford cord, made from rayon yarns, it was shown that the fabric was constructed of 3 yarns in the warp and 1 in the filling, 2 of the warp yarns being filament and the third warp yarn and the filling yarn being spun yarns. The fabric produced is considered softer than the cotton-filled type.
TTD: 7-47

Rayon jacquard fabrics. Some modern rayon jacquard dress goods. Anon. *Silk & Rayon 20,* 1240-1 (Oct. 1946).

The weaving particulars and constructions of figured jacquard rayons are briefiy discussed and illustrated with some design patterns. TTD: 7-47

Weaving terry towels. Even simple terry towel requires considerable calculation. T. Hargreaves. *Textile World 96,* No. 12, 143, 145, 147, 222 (Dec. 1946).

The designs of terry towels for weaving on the C-5 terry loom are described and illustrated with diagrams. Calculations and directions are given for weaving also.
TTD: 7-47

Worsted weaving. Pencil stripe in worsted requires clean-cut weave. R. B. Sendren. *Textile World 97,* No. 1, 137, 198, 200 (Jan. 1947).

Directions are given for laying out pencil stripes in worsted fabrics. Draft and reed plans are given with the aid of diagrams. TTD: 7-47

Knitting — IV 3

Yarn control. Knitting mills tighten their technical standards. C. Mallard Bowden, Textile World. *Textile World 96,* No. 12, 129, 131, 197-8 (Dec. 1946).

To attain better efficiency and increase savings, knitting mills are setting up standards of yarn quality to help reduce yarn stops. Data are obtained on yarn processing qualities and operational tests and then compared. Illustrative charts are shown. From this information standards are set up and are expected to aid in closer control of products and processes. TTD: 7-47

TRICOT FABRIC DESIGN. Thos. Johnson; McGraw-Hill Book Co., New York; 125 pp.; price $2.50.

Reviewed in *Textile World 96,* No. 12, 170 (Dec. 1946). TTD: 7-47

Knitting machines — IV 3 a

Circular knitting machines. Circular knitting machines. J. B. Lancashire. *Textile Recorder 64,* No. 767, 45-6 (Feb. 1947).

British and German machines are compared and discussed, especially as concerns the matter of supply.
TTD: 7-47

Knitting silk hosiery. Return to silk means knitting changes. K. Albert Hahn. *Textile World 97,* No. 1, 131 (Jan. 1947).

Full-fashioned hosiery machinery change-over from rayon to silk is discussed and some principles for this change given. For example, split dividers should be replaced by plain ones to improve the selvedge, the silk carriers should be checked in relation to the sinker head, etc. TTD: 7-47

Tricot knitting machines. Magnesium increases speed of tricot knitting machines. H. H. Nuernberger, Aluminum Co. of Am. *Textile Age 10,* No. 12, 96, 98, 100 (Dec. 1946).

The use of magnesium for reciprocating parts of tricot knitting machines (*e.g.,* in the needle bar, presser, sinker, guide, and cover bars) materially reduces weight and raises the number of cycles per minute from 350 to 800. The biggest single use of magnesium in tricot knitting machines is in the production of sectional warp beams or spools. TTD: 7-47

Hosiery breather openings. Wm. D. White & Geo. W. Graff (to Wayne Knitting Mills). USP 2 421 473, June 3, 1947.

An attachment to the usual narrowing mechanism of foot knitting machines for full-fashioned hosiery, forms a series of small openings arranged in a pattern near the selvedge of the fabric. These openings are in the foot of the stocking under the instep and under the toe, the openings to provide ventilation to help remove moisture from the inside of the stocking.
SPH TTD: 7-47

Severing knitted structures. Chas. Weller. USP 2 422 154, June 10, 1947.

Materials knitted in the form of a continuous tube or web are sometimes made in sections. These sections are held together with a loosely interknitted, removable length of yarn. This device provides a pair of gears working together like a pair of feed rolls with the necessary guides and feed slots to perform the functions of removing the above mentioned threads.
SPH TTD: 7-47

Knitting wrap patterns. Oscar Fregeolle (to Hemphill Co.). USP 2 422 232, June 17, 1947.

On a circular, independent needle knitting machine a notch is provided in the tapered part of the wrap horn (forming a part of the mechanism for producing wrap patterns) which results in the momentary release of the tension in the wrap yarn. This prevents the leading needle from being deflected so that it does not enter its notch in the upper cylinder.
SPH TTD: 7-47

Sinker head. Walter M. Golaszewski & Anthony Kaczor. USP 2 422 479, June 17, 1947.

In the sinker head for a full-fashioned knitting machine the bearings for the knock-over bit are removable from the sinker bar, from which in turn the insert bar is detachable. This arrangement facilitates the construction of the device.
SPH TTD: 7-47

Cleaning knitting machines. John L. Allen. USP 2 422 514, June 17, 1947.

An attachment for a circular knitting machine provides

2 nozzles, one stationary, in front of which the rotating parts pass, and one rotating, which is swept across the stationary parts. Compressed air is provided from an outside source.

SPH TTD: 7-47

Knitting yarn guide. Ernest A. Feustel (to Ernest A. Feustel, Inc.). USP 2 422 535, June 17, 1947.

A yarn guide for full-fashioned hosiery knitting machines or the like, is designed to reduce wear on the guiding surfaces and facilitate replacement of parts likely to wear out.

SPH TTD: 7-47

Electronically controlled knitting machine. Walter Larkin (to Fidelity Machine Co., Inc.). USP 2 422 568, June 17, 1947.

A circular knitting machine having an ordinary pattern drum may have its speed controlled by an electronic motor control patented by General Electric Co. This patent covers the changes and additions to the machine necessary to apply the General Electric control device to a circular knitting machine. When stockings consisting of a welt section, a leg section, a heel pocket, a foot section and a toe pocket are knitted on these machines, it is necessary to operate the machine at different speeds for the different sections to obtain maximum output.

SPH TTD: 7-47

Hosiery knitting. B. T. Cole. Brit. P. 578 898. *Textile Mfr. 72,* 663 (Dec. 1946).

A work rail supports stockings as they come from a knitting machine.

PMS TTD: 7-47

Knitting machine. Max C. Miller (to Knitting Machine Corp.). Can. P. 440 593, Apr. 1, 1947.

A set-up of new fabric is formed on a series of spring-bearded needles by means of a fabric set-up bar having hooks spaced to cooperate with alternate needles. Yarn-measuring sinkers are used to sink the yarn against the needles, and the hooks and needles are moved in relation to each other to cast off from below and over the needle beards and to place the needle wale kinks of alternate needles in the hooks to form a fabric set-up on the hooks and on the intermediate needles. Means are also provided for maintaining the hooks and the loops held thereon out of the path of needle movement during the subsequent knitting of the welt portion of the fabric. The hooks and needles are moved in relation to each other so as to return the loops to the needles and complete the formation of the welt. TTD: 7-47

Hosiery knitting. Arthur N. Cloutier (to Hemphill Co.). Can. P. 440 779, Apr. 15, 1947.

See USP 2 392 312, Jan. 8, 1946 (TTD: *3,* 72) and also Australian P. 122 020, Aug. 29, 1946. TTD: 7-47

Control devices IV 3 b

Knitting machine control. Electronic control. H. W. Anderson, Fidelity Machine Co., Inc. *Machine Design 19,* No. 4, 101-4 (Apr. 1947).

The application of electronic control to high-speed circular knitting machines and the enclosure of this control mechanism in a modernly designed cabinet are briefly discussed with the aid of photographs and a diagram of the electrical circuit. The machine described is the 400-needle type, knitting seamless hosiery. TTD: 7-47

Yarn take-up. Eugene St. Pierre (to Hemphill Co.). USP 2 422 599, June 17, 1947.

The yarn take-up for circular independent needle knitting machines is improved by applying the force of the spring to the take-up lever through a linkage. The linkage is arranged so that while the spring is fully extended and exerts a maximum force, the effective lever aim through which this force operates is reduced. This reduces the lifting force on the take-up lever in its lowest position and allows knitting of very fine yarn without yarn breakage.

SPH TTD: 7-47

Knitting machine control. Jesse J. Lentz. USP 2 422 738, June 24, 1947.

On a full-fashioned knitting machine an ingenious arrangement of ratchets and dogs, for converting reciprocating motion to rotation, controls the rotation imparted to the carrier and to the narrowing and widening spindles. By this means, during a widening rotation, the widening marks are disposed farther from the selvedge and a selvedge is formed in which runs are less likely to develop.

SPH TTD: 7-47

Knitting machine control. Fritz Lambach. USP 2 423 105, July 1, 1947.

The relation of the amount of yarn taken from the beam, the amount of cloth taken up on the cloth beam and the number of turns of the main shaft is a measure of the quality of the cloth being produced by the machine. These items are checked by attaching a counter or indicating pointers to the warp beam, the cloth beam and the main shaft through suitable change-gear trains. These gear trains are to be arranged so that for the given fabric being knitted all the pointers will move at the same speed. By a remote means of indication all of these pointers and counters may be mounted in one panel. Through control means, a dial is driven through proper gearing from the main shaft and a pointer is remotely driven from the warp beam. These are arranged

to revolve about the same axis. When the machine is operating correctly they revolve together. If the pointer moves either faster or slower than the dial a contact is made which causes a small motor to make the necessary adjustments to the machine.
SPH TTD: 7-47

Knitting thread guide. Roy C. Amidon (to Vanity Fair Mills, Inc.). USP 2 423 433, July 8, 1947.

By a method for driving the levers which rack the thread guides on a tricot machine, by means of a pair of conjugate cams, a positive back and forth motion is given to the levers without the use of springs. Back-lash is eliminated by this method.
SPH TTD: 7-47

Yarn take-up. Carlyle H. Wainwright (to Bentley Eng. Co., Ltd.). USP 2 423 630, July 8, 1947.

A yarn tension or take-up device for knitting machines consists of a spring-biased arm which rises when the yarn is slack and is pulled down as the tension increases. A gripper spring holds the yarn between the lever and supply. Downward movement of the lever releases the gripper spring allowing the yarn to be pulled through.
SPH TTD: 7-47

Knitting control. DeHart G. Scrantom (to Western Electric Co., Inc.). Can. P. 440 579, Apr. 1, 1947.

See USP 2 409 961, Oct. 22, 1946 (TTD: *4*, 54).
TTD: 7-47

Marking knit hosiery. Harry N. Sheppard (to Scott & Williams, Inc.). Can. P. 440 954, Apr. 22, 1947.

See USP 2 388 648, Nov. 6, 1945 (TTD: *3*, 25).
TTD: 7-47

Fabric construction IV 3 c

Nylon hosiery. Factors in production of nylon hose. A. R. Munden, British Nylon Spinners, Ltd. *Textile J. Australia 21*, 818 (Feb. 1947); reprinted from *Hosiery Trade J.*

A paper reviewing the production of nylon filament and its processing into hosiery is briefly summarized.
TTD: 7-47

Knitted scouring cloths. Danl. J. Cosgro. USP 2 423 484, July 8, 1947.

An attachment to a standard circular knitting machine flattens the knitted fabric cylinder. The fabric knitted from relatively stiff yarn, such as yarn of metal strands, yarn of a mixture of metal and fabric strands or yarn of stiff plastic strands must be flattened before being removed from the machine. The attachment provides a pair of rolls to flatten the fabric cylinder and a spreading

device to prevent the take-up rolls from reducing the width of the flattened fabric.
SPH TTD: 7-47

Hosiery knitting. Harry N. Sheppard (to Scott & Williams, Inc.). Can. P. 440 557, Apr. 1, 1947.

See USP 2 388 649, Nov. 6, 1945 (TTD: *3*, 25).
TTD: 7-47

Circular knit hosiery. Beale J. Faucette (to Scott & Williams, Inc.). Can. P. 440 688, Apr. 8, 1947.

See USP 2 396 166, Mar. 5, 1946 (TTD: *3*, 233).
TTD: 7-47

Special fabrics IV 4

Imported textiles. Imported fabrics. Thos. C. Nelson, N. C. State College. *Textile Forum 4*, No. 2, 12-13, 36-7 (Summer 1947).

The U. S. Tariff Law applying to textile imports and the methods of examining and appraising the goods are discussed. A number of special fabrics, including light weight summer fabrics with special patterns, swivel fabrics and crepes, dotted swiss fabrics, and some striped Italian fabrics are described and illustrated.
TTD: 7-47

Nonwoven fabric. Avondale's Plastavon is success. Anon. *Southern Textile News 3*, No. 24, 24 (May 29, 1947).

Plastavon (Avondale Mills), a nonwoven cotton fabric, is briefly described. Not so strong as cloth, but softer and more pliable than paper, it can be produced from raw cotton, bleached, dyed or tinted as desired. TTD: 7-47

Fabric treatment. Cyril P. Atkinson (to Courtaulds, Ltd.). USP 2 384 871, Sept. 18, 1945; Can. P. 440 912-13, Apr. 22, 1947.

Raised fabrics of improved handle and appearance are obtained by treating cotton, regenerated cellulose, wool, and casein fibers with an intermediate resin (of cyanamide and formaldehyde), subjecting the fabric to a raising operation, and converting the intermediate resin to an insoluble form (*before* the raising operation).
TTD: 7-47

Tufting device. Saml. P. Parker (to Callaway Mills). USP 2 422 125-6, June 10, 1946.

This device comprises a power-driven hollow needle through which the yarn is fed. A presser foot is rotatably mounted on the frame to prevent the needle from pulling out the last loop when the new loop is inserted. Another embodiment of the device provides an air jet through the hollow needle to prevent the yarn from re-

turning with the needle when the needle is withdrawn from the fabric.
SPH TTD: 7-47

Tufting machine. Jos. K. McCutchen. USP 2 423 605-8, July 8, 1947.

A tufting machine has a number of needles together with a number of loop-forming elements and a number of leaf spring knife members for cutting the loops. Each element is arranged to perform its function in proper relation with the other elements so as to form loops of yarn through the fabric and cut the loops to form a pile or tufted pattern. By an improvement the loops are not cut until 2 or 3 more loops are formed, thus preventing the loops from pulling out as new ones are made. By a modification additional loop-forming elements elongate the loop considerably before it is cut. By another modification loops of yarn are formed in a base fabric but the loops are not cut.
SPH TTD: 7-47

Warp pile fabric. Wm. S. Nutter. Can. P. 440 619, Apr. 8, 1947.

See USP 2 362 299, Nov. 7, 1944 (TTD: *1*, No. 6, 3).
TTD: 7-47

Fabric processing IV 5

Fabric textures. New fabric textures and effects are needed. Theodore I. Felner, R. H. Macy & Co. *Am. Wool Cotton Reptr. 61*, No. 2, 13-14 (Jan. 9, 1947).

A need is felt for improvement in fabric construction and finishes along with better wearing quality. TTD: 7-47

Oil-treating fabrics. Application of dust-laying oil to fabrics. C. H. Bayley, A. S. Weatherburn & G. F. R. Rose. *Can. Chemistry & Process Industries 30*, No. 9, 43-7 (Sept. 1946).

Methods for the application of oil to fabrics have been studied in order to reduce the amount of bacteria-bearing dust scattered into the air during bed-making in hospitals. The application of positive oil-in-water emulsions to wool and of negative oil-in-water emulsions to cotton is described, as well as the chemistry involved. Pilot-plant and commercial-scale trial of this process is also described. TTD: 7-47

Tenters. Cotton goods finishing methods and machines. Anon. *Am. Wool Cotton Reptr. 60*, No. 50, 11-12, 44-6 (Dec. 12, 1946).

Tenters as drying and finishing machines are surveyed, drives, speeds, plant layout, and temperature control (important in assuring proper evaporation) being some of the factors considered. TTD: 7-47

Tenters. Cotton goods finishing methods and machines. Anon. *Am. Wool Cotton Reptr. 61*, No. 2, 11-12, 44-5 (Jan. 9, 1947).

Tenters, particularly the Palmer, for drying and finishing fabrics are discussed in general. TTD: 7-47

Hosiery boarding. Robt. J. Moody & John E. Taylor (to Scott & Williams, Inc.). USP 2 421 638, June 3, 1947.

When nylon or other synthetic fibers are knitted into stockings on the Scott & Williams circular knitting machine, it is difficult to place the stocking on the boarding form correctly to give the desired shape. An attachment to the machine places a fugitive dye of contrasting color on one or more wales on the front and back of the stocking. This enables the operator to get the stocking on the boarding form correctly so that it will be in the desired shape after finishing.
SPH TTD: 7-47

Cloth guider. John D. Robertson (to Mt. Hope Machinery Co.). USP 2 422 369, June 17, 1947.

This cloth guider uses the tilting roll principle of prior cloth guiders but the tilt of the rolls is more sensitively responsive to selvedge deviations. A drag imposed on one or more sections of the guide rolls, causes the guide rolls to tilt in the direction to correct the travel of the selvedge.
SPH TTD: 7-47

Cleaning fabrics. Geo. P. Herbard & Herman E. Sheets (to Am. Machine & Metals, Inc.). USP 2 422 897, June 24, 1947.

The fabric is agitated in a series of baths and soap is added at a constant rate which is faster than the rate at which it is used up in the cleaning process. Under these conditions, an initial blanket of suds is formed to a definite level. When this level is reached, the soap supply is cut off. If the fabric is clean at this time, the suds will remain at this level; if not, the depth of suds will decrease, and the washing process must be repeated. An apparatus is described in which the suds level is indicated by means of electric curcuits. In this way, the amount of detergent used is limited to the amount required to remove the soil from the particular batch of material. TTD: 7-47

Designing nylon fabric. Elmer F. Seemuller. USP 2 424 124, July 15, 1947.

A male dye has points inserted in it to form the desired design. The points are connected to a source of dry heat or live steam so that, when they are inserted into a fabric, the stitches are enlarged or stretched. The method can be used on any nylon knitted or woven fabric.
TTD: 7-47

Fabric applications IV 6

Rubber-coated diaphragms. Irven E. Coffey (to Carter Carburetor Corp.). USP 2 422 529, June 17, 1947.

An improved diaphragm material of the synthetic rubber-coated type for use in automotive fuel pumps is made by weaving a cloth with unequal tensions in the warp and weft, impregnating, and then coating the cloth with a plastic material by passing the cloth between rolls to which the plastic is applied in the direction of the looser threads to equalize the tension on the warp and weft, so that the strains applied to the diaphragm in service will be uniformly resisted in both directions.

TTD: 7-47

Flexible waterproof material. Edw. H. Colesworthy. USP 2 423 294, July 1, 1947.

A pliable, waterproof, laminated material for making bags consists of a layer of loosely woven membrane between 2 layers of crinkled paper held together by an asphalt or other suitable adhesive. The machine for producing the material is described.

SPH TTD: 7-47

Surgical gauze. Wm. O. Kenyon & Cornelius C. Unruh (to Eastman Kodak Co.). USP 2 423 707, July 8, 1947.

When cellulose is sufficiently oxidized with NO_2, it becomes absorbable by human body fluids and is hemostatic. When surgical gauze is treated with NO_2, however, uniform oxidation is not obtained and the inner fibers of the threads remain unabsorbable. This patent specifies treating the fiber with NO_2 before fabrication into gauze. It is recommended that the oxidation be carried out in a solution of N_2O_4 in an inert solvent such as CCl_4, as described and claimed in Kenyon and Yackel's application, Serial No. 571 012 (see also TTD: *4*, 140-1). TTD: 7-47

Laminate. Fred. G. Dodge (to Camille Dreyfus). Can. P. 440 976, Apr. 22, 1947.

A number of textile fabrics containing a thermoplastic material are assembled in a bundle, thin strips are cut from the bundle and are attached to a backing strip by the action of heat and pressure. The thermoplastic material may have a base of cellulose acetate. TTD: 7-47

CHEMICAL RAW MATERIALS V

Glass-plastic laminates. Production and fabricating possibilities of glass fabric reinforced plastics. Games Slayter, Owens-Corning Fiberglas Corp. *Modern Plastics 24*, No. 4, 142-5 (Dec. 1946).

The use of laminates of resin-impregnated glass fiber

cloth for automobile body parts such as tops, body panels and bumpers, is briefly discussed and the molding of these parts described in some detail. TTD: 7-47

Polyvinyl chloride coating. Coating with polyvinyl chloride latex. M. S. Moulton, B. F. Goodrich Chemical Co. *Modern Plastics 24*, No. 2, 117-20 (Oct. 1946).

Geon latex (B. F. Goodrich Chemical Co.), a polyvinyl chloride type polymer, has found extensive use in the fabric coating field. Its properties and methods of application are briefly reviewed, the latex and the solvent processes being compared. TTD: 7-47

Properties of rubber. Photo-elastic properties of rubber. L. G. R. Treloar, *Trans. Faraday Soc. 43*, 277-93 (May, 1947).

Vulcanized rubber, subjected to the most general type of homogeneous strain, was considered as a molecular network, essentially similar to that already successfully applied to the determination of the mechanical properties of vulcanized rubber, and some simple relationships between optical and mechanical properties were discovered. The equations derived are valid only up to moderate strains. Although no actual molecular structure conforms exactly to the idealized model, the behavior of any flexible molecule will approximate that of the random chain at moderate extensions; and, with this limitation, the theory should be valid for all rubber-like materials. Experimental birefringence data are presented for temperatures of $-50°$ to $+100°$ with the purpose of distinguishing between birefringence due to crystallization and that due to stress. The effects produced by the swelling of rubber by solvents before stretching were also examined. It is concluded that the molecular network theory gives a reasonably accurate description of the optical properties of stretched rubber in the dry and in the swollen state, so long as crystallization is avoided.

TTD: 7-47

Resin applications. Textile applications of synthetic resins. Philip B. Law. *Textile J. Australia 22*, 68-74 (Mar. 1947).

The preparation, properties, and the uses of synthetic resins are outlined in a brief review.

ELW TTD: 7-47

Surface-active agents. Precipitation and saponification using surface-active agents. Erwin M. Losee. *Can. Chemistry & Process Industries 30*, No. 9, 90-2 (Sept. 1946).

Some considerations leading to the solution of a particular surface-active agent for a given purpose are discussed. The use of a cationic agent for precipitating impurities from a rayon acid spinning bath is described.

TTD: 7-47

Vinyl ether. Catalytic polymerization of *N*-butyl vinyl ether. D. D. Eley & D. C. Pepper. *Trans. Faraday Soc. 43,* 112-19 (Mar. 1947).

In the undiluted monomer, there appeared to be a threshhold catalytic concentration below which reaction occurred only very slowly. Above this concentration, there is a short induction period, followed by rapid reaction. The monomer was also dissolved in petroleum ether, the catalyst added and the mixture transferred quickly to an Ostwald viscometer and the viscosity determined as a function of time. The curves show a period of induction, followed by acceleration of the rate. Samples were withdrawn during a typical reaction, immediately shaken with water to stop the reaction, and the percentage polymerization determined. The results agreed closely with percent polymerization calculated from viscosity. TTD: *7-47*

Vinyl resin coating. Ether esters, plasticizers for vinyl coating. F. J. Tuttle & E. B. Kester, R. B. H. Dispersions & Western Regional Research Laboratory. *Modern Plastics 24,* No. 4, 163-6 (Dec. 1946).

From tests made using 2 vinyl chloride-acetate copolymers and polyvinyl butyral, in a study of plasticizers and their application to vinyl resins for coated cloth, certain fatty esters appear to offer such desirable characteristics as low volatility and resistance to crack at low temperatures. TTD: *7-47*

Woven polyethylene. Beauty from woven polyethylene. Anon. *Modern Plastics 24,* No. 3, 107 (Nov. 1946).

Handbags woven from extruded polyethylene resin monofils are illustrated and briefly described. TTD: *7-47*

Denitrating nitrocellulose. Frank H. Reichel & Ralph T. K. Cornwell (to Am. Viscose Corp.). USP 2 421 391, June 3, 1947.

Nitrocellulose dissolved in a mixture of alcohol and ether is extruded through an annular orifice into water and then into a denitrating bath, such as Na_2S solution, the pH of which is maintained between 11 and 11.5 by the addition of an acid or a buffer, such as ammonium sulfate. This prevents degradation of the cellulose. The process is applicable to the various elongated products made from nitrocellulose, such as filaments, films, bands, tubing, casings, coatings, yarn threads and fabrics. TTD: *7-47*

Weaving plastic fabrics. Edw. Welti (to Hafner Associates, Inc.). USP 2 421 532, June 3, 1947.

Plastic fibers are heated to a temperature at which they become sufficiently soft and pliable to cause the warp and weft threads to stick together on cooling. In some cases, the heating of only the weft is sufficient. This is accomplished by placing electrical heating elements in the bobbin magazine. TTD: *7-47*

Cellulose ether coating. Leon Lilienfeld (to Lilienfeld Patents, Inc.). USP 2 422 573, June 17, 1947.

A finish which is fast to laundering, resistant to wear and tear, and has a soft feel is produced by treating textile materials with a solution of a degraded cellulose ether, such as xanthated cellulose, in a caustic alkali. TTD: *7-47*

Polyvinyl acetal resins. Gelu S. Stamatoff (to E. I. duPont de Nemours & Co.). USP 2 422 754, June 24, 1947.

Polyvinyl alcohol in aqueous solution is added, at 25-90°C, over a period of at least 2 min., and with agitation, to an aldehyde containing at least 2 C atoms in the presence of an acid catalyst. The rate of mixing and agitation are regulated to precipitate the resin in a finely divided state, with little tendency to agglomerate. The reaction mixture is stirred continuously and maintained at 40-90°C until the condensation has proceeded to the desired endpoint. The process is especially applicable to butyraldehyde and benzaldehyde. The product is soluble in acetone but insoluble in water. TTD: *7-47*

Cellulose derivatives. Jas. W. Fisher (to Brit. Celanese, Ltd.). USP 2 423 883, July 15, 1947.

Cellulose ethers, especially those containing 2 alkyl radicals per $C_6H_{10}O_5$ unit, are esterified with anhydrides of carboxylic acids containing at least 6 C atoms in the presence of metal halides. The reaction is almost quantitative. Halogenated hydrocarbons, especially ethylene dichloride, are suitable inert esterification media for hydrophobe ethyl cellulose esters; pyridine may also be used. The products are soluble in a wide variety of organic liquids and may be used as plastic compounds for insulating electric wires, cables, condensers, etc., and for waterproofing fabrics or wrapping foils. TTD: *7-47*

Plasticizer. Geo. W. Seymour & Blanche B. White (to Camille Dreyfus). Can. P. 440 975, Apr. 22, 1947.

Cellulose esters and ethers and a polyglycol ether of the formula $R—(O—CH_2CH_2)_n—X$ in which R is an aryl group, X is an alkoxy group and n is an integer of 2 to 4. Cellulose acetate with the mixed methyl phenyl ether of diethylene glycol is claimed specifically. TTD: *7-47*

THE ALKALINE-EARTH AND HEAVY-METAL SOAPS. Stanley B. Elliott. Reinhold Publishing Corp., New York, N. Y.; 1946; 342 pp.; price $7.50.

Reviewed in *Textile Research J. 17,* 35 (Jan. 1947). TTD: *7-47*

FUNDAMENTALS OF PLASTICS. H. M. Richardson & J. Watson Wilson. McGraw-Hill Book Co.; 1946; 483 pp.; price $5.00.

Reviewed in *Chem. Industries 61,* 286 (Aug. 1947). TTD: 7-47

CHEMICAL PROCESSING VI

Detergency. Study in detergency. Anon. *Am. Dyestuff Reptr. 36,* 91-6 (Feb. 24, 1947); *Textile Age 11,* No. 1, 70-1 (Jan. 1947).

Using the Detergency Comparator developed by the Wool Detergency Subcommittee of the AATCC, the scouring efficiency of soap was compared to that of synthetic anionic, nonanionic and cationic detergents, with these variables: bath to cloth ratio, additions of Na_2CO_3, $NaHCO_3$, Na_2SO_4 and H_2SO_4. A general conclusion would be that 10% of each detergent with 6% of Na_2CO_3 to give an initial pH of about 11.0 produces excellent over-all results in oil and lampblack removal.
ELW TTD: 7-47

Durable finishes. Durability sought by textile finishers. R. A. Pingree. *Textile World 96,* No. 12, 108-9, 210, 212, 215 (Dec. 1946).

A discussion of some of the achievements of the finishing industry with particular reference to durable finishes. The use of resins, softeners, and stiffeners are discussed, as well as several processes for shrinkproofing wool, creaseproofing, flameproofing, waterproofing and controlling the luster of rayon. TTD: 7-47

Finishing. Finishes. Anon. *Textile Colorist 69,* No. 2, 22, 45 (Feb. 1947).

Ban-Flame (Jos. Bancroft & Sons) and 3-164 (U. S. Finishing Co.) durable mildewproof finishes are reviewed in a series of questions and answers. TTD: 7-47

Finishing. Finishes. Anon. *Textile Colorist 69,* No. 3, 27 (Mar. 1947).

"Apponized" is the trade mark of the Apponaug Co.'s process of finishing cotton or viscose rayon piece goods and blends. There are 4 Apponized finishes, differentiated by the letters "A, C, I, or S", which are permanent and give varying results of sheerness, stiffness, stabilization and the like. TTD: 7-47

Gums. Guar . . . old crop with new future. John A. Esser, General Mills Research Laboratory. *Chemurgic Digest 6,* 229, 232-4 (Aug. 15, 1947); reprinted from *Progress Thru Research* (General Mills, Inc.).

Guar, a drought-resistant legume from India, is being developed by General Mills as a cash crop. Its beans

furnish gum for warp sizing, printing pastes, and finishing.
LCL TTD: 7-47

Resin finishing. Synthetic resins in textile finishing. A. J. Hall. *Textile Recorder 64,* No. 767, 53-4 (Feb. 1947).

Developments in 1946 are briefly reviewed. TTD: 7-47

Scouring. Conservation of alkaline ingredients in piecegoods scouring. N. W. Gillam, Shell Co. of Australia, Ltd. *Textile J. Australia 22,* 8-11 (Mar. 1947).

The scouring of woolens and worsteds is reported, with allowances made for the different qualities and types of wool used in the various processes, with a view to assisting mills in economizing in the amount of alkali used without reducing efficiency. The work is described in some detail and practical suggestions offered using the normal processing machinery and routine of operations.
ELW TTD: 7-47

Textile finishing. Chemical developments in textile finishing. L. J. Sheps, Onyx Oil & Chemical Co., Ltd. *Can. Chemistry & Process Industries 31,* 304-7 (Apr. 1947).

The 4 major classes of organic synthetic chemicals now used in textile finishing are reviewed: anionic chemicals, such as sulfonated oils; cationic chemicals, such as quaternary ammonium compounds; nonionic compounds; and synthetic polymers. These polymers can be applied to textiles by surface coating, discontinuous surface impregnation, and intra-fiber deposition. Twenty-five references. TTD: 7-47

Wool scouring. Anon. *Silicate P's & Q's 27,* No. 10 (Oct. 1947).

A brief note on wool scouring practices of the past and present. The use of silicate detergents instead of soda ash, for wool scouring is briefly discussed, particularly with respect to C Brand and Metso Granular (sodium metasilicate pentahydrate). TTD: 7-47

Cellulose ethers for finishing. Leon Lilienfeld (to Lilienfeld Patents, Inc.). USP 2 422 572, June 17, 1947.

When the degradation of alkali-soluble, water-insoluble cellulose ethers is carried so far that they are deprived of their capacity to form coherent films, but short of becoming soluble in water, the product is valuable as a textile finish. When applied as solutions or pastes in dilute alkali, these degraded cellulose ethers do not impair the soft feel of the fibrous materials to which they are applied and the finishes thus obtained are relatively fast to commercial laundering. They do not stiffen the

fabric or change its appearance. The cellulose ethers are treated with substances which exert a hydrolyzing, oxidizing or degrading action on them. Other oxy-organo compounds of cellulose, such as cellulose ether-esters, cellulose esters, and cellulose thiourethanes can also be used. TTD: 7-47

Resin bonding. John D. Pollard (to Am. Cyanamid Co.). USP 2 423 428-9, July 1, 1947.

The bonding properties of cellulosic textiles and non-cellulosic organic materials such as silk, nylon, wool, etc., are improved by impregnating with an acidic aqueous colloidal solution of melamine-formaldehyde resin under conditions such that the treated fibers contain 0.01-2% of water-insoluble resin. The aqueous solvent in which the resin is aged may contain substantial amounts of polyhydric alcohols such as glycerol or ethylene glycol, in which case the hydrophilic colloid can be obtained at pH values as high as 6.8. Since acid causes degradation of cellulose, this is an important advantage of the process. TTD: 7-47

Milling wool-acetate blend. Alan S. Cluley & Tom G. Allen (to Courtaulds, Ltd.). Can. P. 441 059, Apr. 29, 1947.

See USP 2 407 602, Sept. 10, 1946 (TTD: *3*, 460). TTD: 7-47

INTRODUCTION TO TEXTILE FINISHING. J. T. Marsh. Chapman & Hall, Ltd., London; 1947; 522 pp.; price 35s.

Reviewed in *Can. Chemistry & Process Industries 31, 762* (Aug. 1947). TTD: 7-47

COLOR VII

Color perception bibliography. Relation of color perception to chemical structure: a critical bibliography. I. H. Godlove. *Textile Research J. 17,* 185-98 (Apr. 1947).

References on color perception, chemical structure, and physical data are classified into (1) (psycho-) chemical correlations, (2) physico-chemical correlations, and (3) the physical data (absorption spectra). Ninety-four references. TTD: 7-47

Bleaching VII 1

Bleaching. Bleaching speeded up from days to hours. Kenneth H. Barnard. *Textile World 96,* No. 12, 104-5, 208, 210 (Dec. 1946).

A bleach house of the early twenties and one of today are described. Closer control by automatic devices, better machinery, and the like have increased speed and quality of work. There has been some change in the chemicals used, acid being found cheaper than enzyme. TTD: 7-47

Bleaching process. Robt. L. McEwen (to Buffalo Electro-Chem. Co., Inc.). Can. P. 440 506, Apr. 1, 1947.

Cellulosic materials with portions dyed with naphthol dye are bleached by dampening with less than 90% of their weight of alkali peroxide bleaching solution with a pH of less than 9.5 and heating in an atmosphere containing steam under conditions which prevent the condensation of substantial amounts of steam on the goods. When the goods contain motes, they are dampened with alkaline peroxide and left to stand at a temperature below 125°F until the motes are softened. The cloth is then washed before being bleached at the higher temperature as previously described. TTD: 7-47

Dyeing VII 2

Beam dyeing plant. Improved beam dyeing plant. Anon. *Textile Recorder 64,* No. 767, 47-8 (Feb. 1947).

A beam dyeing plant (Baldwin & Heap, Ltd.) is briefly described and illustrated. The 4-beam, 2-beam, and single-beam machines are mentioned, the 2-beam, more generally used, being described in somewhat more detail. TTD: 7-47

Dye industry development. Entire dyestuff industry developed since World War I. A. G. Brunier. *Textile World 96,* No. 12, 106-7 (Dec. 1946).

A review of the development and improvement of the industry. TTD: 7-47

Dye penetration. Good penetration is vital in dyeing and printing. Anon. *Silk & Rayon 20,* 1243, 1245 (Oct. 1946).

One of the most important essentials in dyeing and printing is good penetration of the dye. Dye liquors and the like must be prepared with this factor in view. Methods of attaining thorough penetration (such as pigment padding, pigment vat dyeing, spin dyeing, etc.) are described. TTD: 7-47

Dye treatment. Improvement of resistance to washing of substantive and acid dyes by treatment with water repellents. G. Nitschke. *Zellwolle u. Kunstseide 2,* 17 (1944); *Kolloid-Z. 108,* No. 1, 62 (July, 1944).

The method described comprises using 1 bath containing paraffin emulsions with an emulsifier and aluminum or rare earth salts. The translucency of some materials was increased 10% and the adherence of dirt was lessened. Although the resistance of a few steeping dyes was raised, this was not true in the case of silk. TTD: 7-47

Dyeing and finishing. Dyeing and finishing progress described at AATCC convention. Anon. *Textile Age 11,* No. 1, 42, 44-6 48, 50 (Jan. 1947).

Papers presented at the Silver Jubilee meeting are very briefly summarized. TTD: 7-47

Dyeing rayon blends. All important question of good black shades. Anon. *Silk & Rayon 20,* 980, 982, 1246, 1248 (Aug., Oct. 1946).

The methods of producing black shades on mixtures of viscose and acetate rayons and cotton and rayons are given, and some of the complications arising are mentioned. TTD: 7-47

Dyeing cotton. Dyeing of natural cotton with direct dyes. Determination of heat of dyeing. R. P. Graham & H. J. Fromm, McMaster Univ. *Can. Chemistry & Process Industries 31,* 645 (July, 1947).

The equilibrium sorption of a purified direct dye on natural cotton yarn has been measured over a range of concentrations and temperatures. The liquor-to-yarn ratio in the dye-bath containing NaCl was sufficiently high so that the concentration of dye in solution was essentially constant throughout a dyeing experiment. The dye was stripped from the skeins by using an alcohol-pyridine-water solution, the concentration of dye in the latter being determined spectrophotometrically. The differential heat of dyeing may be calculated from the results obtained. TTD: 7-47

Metallized azo dyes. Geo. L. Royer & Chester A. Amick (to Am. Cyanamid Co.). USP 2 422 586, June 17, 1947.

Nitrogenous fibers are dyed with metallized acid monazo dyes containing an amino group and a hydroxy group ortho to the azo group in the presence of an aliphatic aldehyde having less than 6 C atoms. The process is especially effective with Cr dyes and good results are also obtained with dyes metallized with Cu, Fe, Mn, Co and other metallizing metals. The aldehyde imparts a softness to the fiber which is not obtained when H_2SO_4 alone is used, and prevents the loss in tensile strength caused by the acid. TTD: 7-47

Dyeing cellulose acetate. Christopher S. Argyle (to Henry Dreyfus). Can. P. 441 116, Apr. 29, 1947.

Cellulose esters or ethers, especially acetate, are colored with an aromatic azo compound containing at least one nitro group, one etherified phenolic hydroxyl group and free from salt-forming groups. TTD: 7-47

Printing VII 3

Printing. Change has been gradual in textile printing. R. W. Jacoby. *Textile World 96,* No. 12, 110-11 (Dec. 1946).

Developments in textile printing in the past 25 years are reviewed. Improvements in color, fastness, and processes are described. TTD: 7-47

Screen printing table. John B. Kozloff. USP 2 423 391, July 1, 1947.

A screen printing table the top of which consists of a metal screen covered with a layer of felt and a layer of muslin is provided with a chamber under the top which is heated by steam or other means. A fan introduces air into the heated chamber. The warm air escapes through the top facilitating the drying of the printed work.
SPH TTD: 7-47

Measurement and defects VII 4

Color reflectance. Radiant energy reflectance of men's-wear colors. Helen F. Greenler & Frank J. O'Neil, Pacific Mills. *Textile Research J. 17,* 63-8 (Feb. 1947).

Spectrophotometric measurements were made in the visible and in the near infrared regions on samples of worsted fabric representing many colors used on men's wear, by means of a General Electric Recording Photoelectric Spectrophotometer. Visible and infrared energy reflectances were obtained from the resulting curves by integrating each region. The average for the entire region, 400-1,000 mμ, gave the radiant energy reflectance of the color. Although white exhibited the greatest reflectance. the white material also transmitted more energy than any of the other colors measured. Transmission was found to be reduced considerably in the dyed fabrics, and it was found that even in the lighter colors in men's wear, transparency was negligible. A test was conducted in which a number of sport shirts were worn by several individuals. The shirts were made up in colors selected particularly for their superior or inferior spectral characteristics. Each participant wore alternately 2 shirts of different radiant energy reflectances intermittently for a period of about 3 months in the summer and was requested to express his opinion as to their comparative coolness. The shirts were of worsted fabric dyed in 4 different colors, 2 tans and 2 browns, selected from the men's-wear colors studied in this investigation. The spectral characteristics of the 2 tans showed that the greatest difference between them was in the infrared region, the visible reflectance being almost the same. Likewise, the difference between the browns

was due, for the most part, to the difference in infrared characteristics. The wearers said that the tan felt noticeably cooler when worn in direct sunlight than the brown. This selection was in favor of the shirt with the higher reflectance characteristics. Individuals wearing these colors showed a slight preference for a color which was somewhat higher in infrared reflectance.

TTD: 7-47

Dyeometer. Dyeometer measures rate dye leaves bath. Anon. *Textile World 96,* No. 12, 115 (Dec. 1946).

A brief discussion of the dyeometer with a description of the apparatus is given. It is used to measure reduction rate of vat dyes, formation of dyes, variation in fibers and the like. Dyebath changes during dyeing can also be continuously measured. A modified spectrophotometer is used for recording. TTD: 7-47

Faults in printing. Methods of avoiding furnisher faults in textile printing. J. H. Downey. *Textile Age 10,* No. 12, 40, 42, 44, 46, 48 (Dec. 1946).

Sticking-in, soiling, and stripping-out are 3 faults in printing associated with the furnishers (that supply the print paste to the engraved rollers) which are briefly described and remedies for which are indicated.

TTD: 7-47

PROOFING VIII

Flammability. California law bans inflammable textiles. Anon. *Textile World 97,* No. 1, 218 (Jan. 1947).

California is the first state to adopt flammability laws. There are specified tests through which materials must pass and specific regulations regarding the results.

TTD: 7-47

Flammability. Flammability . . . burning question, indeed! Anon. *Textile Colorist 69,* No. 2, 16-17, 41 (Feb. 1947).

The flammability law of California and proposed federal laws are discussed. A leaflet relating to minimum fire standards of wearing apparel in California, issued by the State Fire Marshal, is discussed. TTD: 7-47

Proofing canvas. Canvas engineering. Jas. E. Hooper, Wm. E. Hooper & Sons. *Natl. Canvas Goods Mfrs. Rev. 22,* No. 9, 40, 42-3 (Dec. 1946); *Textile J. Australia 22,* 36, 38 (Mar. 1947).

Some of the treatments developed for canvas to make it resistant to mildew, moisture, etc., are briefly surveyed.

TTD: 7-47

Rotproofing. Rot proofing efficacy of mixtures of metallic naphthenates. C. H. Bayley & Muriel W. Weatherburn, Natl. Research Laboratories (Ottawa). *Can. Chemistry & Process Industries 31,* 645 (July, 1947).

Ternary mixtures of the naphthenates of Cd, Cu, Pb, Hg, Ag, and Zn, applied to cotton fabric in equivalent concentration of total metal, were in general more effective than the single naphthenates and the binary mixture of the same compounds. The soil burial method was used. TTD: 7-47

Shrinkproofing wool. Wool-preshrinking—survey of U. S. and British progress. N. B. Willatt. *Textile Age 11,* No. 2, 34, 36, 38, 40-2, 44 (Feb. 1947).

Wool and wool mixtures are preshrunk by 4 main types of processes: wet chlorination, dry chlorination, enzyme processing, and resin impregnation. During the war demand was responsible for increased efficiency in these processes and many improvements. Of the 4 processes, resin impregnation is the most recent and is a challenge to the other 3. A combination of the chlorination and enzyme processes is the "chlorzyme" process, still in the experimental stage. Future development will be dependent not only on improvements in the actual finishing, but also on developments in control testing and examination, such as microscopic examination of fibers.

TTD: 7-47

Waterproof seam. Howard H. Haman & John A. Ritzler (to Warren Featherbone Co.). USP 2 422 676, June 24, 1947.

A mechanism is described which applies a fabric tape coated with polyvinyl resin to a stitched seam connecting 2 pieces of fabric coated with polyvinyl resin. The joint is heated and pressed continuously as the tape is applied so that the resin flows into the perforations caused by the stitching operation. TTD: 7-47

Flameproofing film. Wm. A. Hoffman (to E. I. du-Pont de Nemours & Co.). USP 2 422 730, June 24, 1947.

Non-fibrous transparent, highly durable, and flame-resistant films of regenerated cellulose are produced by incorporating in the film at least 20 wt.% of a salt of sulfamic acid, at least 10% of a hydroxyl-containing softening agent, and from 0.5 to 5% of a substance yielding formaldehyde. The regenerated cellulose sheet is put through a series of purifying, bleaching and washing operation and then through an aqueous bath containing ammonium sulfamate, glycerol and formaldehyde. The films do not become hazy even at low temperatures and low humidities because the formaldehyde prevents the crystallization of the ammonium sulfamate

TTD: 7-47

TESTING AND ANALYSIS IX

Bedding material terms. Bedding materials now defined. J. Davis Donovan. *Ind. Standardization 18,* 29-31 (Feb. 1947).

Standards defining the terms used in describing filling materials for bedding and upholstery, cover cotton, wool, and miscellaneous materials. This work was developed by the American Standards Assn. and is sponsored by the Natl. Assn. of Bedding and Upholstery Law Enforcement officials. TTD: 7-47

Consumer desires. What consumer wants in standardization. Carol W. Moffett. *Ind. Standardization 18,* No. 1, 6-8, 26 (Jan. 1947).

Consumer wants regarding fabric standarization include color fastness, shrinkage control, durable weaves and quality of thread. TTD: 7-47

Flammability standard. Proposed commercial standard for textile flammability. Anon. *Ind. Standardization 18,* No. 6, 149-50 (June, 1947).

Reactions to the proposed standard (based on the pending Arnold-Capehart bill) being circulated to the trade by the Natl. Bureau of Standards are discussed. TTD: 7-47

ASTM Standards on Glass and Glass Products. Am. Soc. for Testing Materials, Phila., Pa.; 1946; 95 pp.; price $1.25.

Reviewed in *Textile Research J. 17,* 224 (Apr. 1947). TTD: 7-47

Testing Terms for Better Understanding. Anon. U. S. Testing Co., Hoboken, N. J.; revised ed.

Reviewed in *Ind. Standardization 18,* No. 7, 183 (July, 1947). TTD: 7-47

Physical properties IX 1

Abrading test. Abraser technique simplifies wear-testing of textile goods. Arthur P. Schulze. *Textile Age 11,* No. 1, 82, 84-6 (Jan. 1947).

Maintaining quality control and production and measuring product serviceability are better assured by use of a wear-testing technique described (Taber Abraser test). The procedure for testing is briefly outlined. TTD: 7-47

Abrasion testing. Uniform abrasion in testing of textiles. Anon. *Tech. News Bull. Natl. Bur. Standards 31,* 70-1 (June, 1947).

A mathematical solution of abrasion has been worked out and a machine, based on the solution, is described. The machine can abrade plane areas, such as fabrics,

equally from every direction and can test several specimens at one time. TTD: 7-47

Air permeability measurements. Relationship between measurements of air permeability by 2 machines. M. I. Landsberg & Gerald Winston, Phila. QM. Depot. *Textile Research J. 17,* 214-21 (Apr. 1947).

The instruments most commonly used in government test laboratories are the Gurley Densometer and the Frazier Air Permeameter. These insturments were studied to determine the relationship between results obtained by these instruments, to decide which instrument gave the most reproducible results and maximum sensitivity over a wide range, and the least number of samples required for a statistically sound result. A relationship was established between measurements made on the 2 instruments and it was found that the Gurley Densometer should be used on fabrics of low porosity and the Frazier instrument on materials of high porosity. TTD: 7-47

Cotton tire cords. Endurance of cotton tire cords and fibers under static tensioning. Enoch Karrer, Jas. N. Grant & Rollin S. Orr, Southern Regional Research Lab. *Textile Research J. 17,* 314-22 (June, 1947).

Regular commercial rayon and cotton cords, experimental cotton cords manufactured and mercerized in the laboratory, and mercerized and unmercerized cotton cords from a selected variety manufactured on standard commercial equipment were tested. The tensioning load was plotted against the logarithm of time under tension before rupture. For cotton cords, this relation is rectilinear at room temperature: for rayon cords, the curves are slightly convex away from the tensioning axis. For unmercerized cotton, the relation is linear at room temperature over a range of 10 sec. to 3 wks., and at 276°F, for 10 sec. to 1 hr. Mercerized cotton cord gave a nonlinear relationship at elevated temperatures. Single fibers from the cotton used to construct the cord and filament removed from the rayon cords give similar curves. It is concluded that the breaking of single fibers or filaments under static tension is due to a flow of the micro-elements, and the rupture of the cord is likewise due to flow in the fibers or filaments and not to the movement of fiber past fiber. TTD: 7-47

Cotton fiber swelling. Microscopical methods in measurement of swelling cotton fibers: a literature survey. Mary L. Rollins, Southern Regional Research Laboratory. *Textile Research J. 17,* 19-26 (Jan. 1947).

There is virtually no work reported on the microscopical measurement of raw cotton fibers swelled in water.

The majority of studies were made on fibers that had been either mercerized or purified by boiling in sodium carbonate, and much of the work had to do with the swelling of dry fibers upon immersing in a solution of one of the alkali metal hydroxides. It is difficult to compare results of one worker with those of another because of the variations in the pretreatment of fibers. In view of the limited amount of information available, a number of research problems were suggested.

TTD: 7-47

Denier-strength determinations. Determination of denier and strength of single filaments by vibroscope and Heim tensile tester. V. E. Gonsalves, A. K. U. *Textile Research J. 17,* 369-75 (July 1947).

The denier of short single filaments can be determined quickly and simply by means of a vibroscope which was developed by the author. The filament is attached to the mobile soft-iron tongue of a magneto-dynamic loud speaker system, supplied with a. c. If the frequency of the a. c. is made equal to the resonance frequency of the filament, the filament will vibrate in standing waves. Data thus obtained are used to calculate denier. The Heim tensile tester is of the pendulum type, with an optical system for strength-elongation recording. The strength-elongation curve can be recorded photographically. Some vibroscopic denier determinations are tabulated and discussed. Data for the Heim tensile tester are compared with measurements made by the flat-bundle method. Examples of routine determinations of denier, strength, and elongation of staple fiber are tabulated. TTD: 7-47

Dielectric measurements. Conducting paint electrodes for dielectric measurements. E. Gerald Meyer & Myron A. Elliott, Naval Research Laboratory. *ASTM Bull.* No. 147, 63-4 (Aug. 1947).

Directions are given for preparing a colloidal silver solution, which, sprayed on wood, fabrics, etc., produces an electrode for dielectric measurements.

HAM TTD: 7-47

Fiber properties. Tensile and torsional properties of textile fibers. L. G. Ray, Jr., E. I. du Pont de Nemours & Co. *Textile Research J. 17,* 1-6 (Jan. 1947).

Tensile properties were determined by means of a modified chain-weight balance, on which single filaments could be elongated 0.5-3% and the stress could be determined to 0.02 g. An autographic apparatus, using electromagnetic strain gages, was later adopted. Stress-strain hysteresis curves were obtained, from which (1) Young's modulus, (2) a value defined as the recovery modulus, (3) the work required to elongate the fiber, (4) the work recovered as the fiber returns to its original form, and (5) an approximate value of the Hook's law limit of the fiber were determined. In general, materials with a soft hand are characterized by low values of Young's modulus, and *vice versa.* A reasonably good correlation of resilience with work recovery and modulus was found. Torsional properties were determined by using single fibers for torsion pendulums and measuring the characteristics of the pendulum, from which the force constant of the pendulum suspension and the rigidity or torsional modulus were calculated. These values agreed with direct determinations made later. These rigidity values probably reflect the strength of the interchain forces of oriented materials. Wool has a high value; nylon a low value. A rough measure of anisotropy can be obtained by comparing the rigidity modulus and Young's modulus. TTD: 7-47

Fiber resilience. Resilience of fibers and fabrics. J. H. Dillon, Textile Research Inst. *Textile Research J. 17,* 207-13 (Apr. 1947).

A review of published definitions of the resilience of single fibers, yarn, bulk fibers and fabrics shows that the majority of investigators regard resilience as the ratio of energy of retraction to energy of deformation. However, the value of this ratio changes with temperature, moisture, rates of strain and retraction, number of cycles, rest periods between cycles, and the nature of the cycle. Resilience must therefore be measured under the particular conditions of service of the product under consideration. The resilience of clothing, upholstery, pile fabric and tire cord is discussed. TTD: 7-47

Fiber samples. Use of supersonics in preparation of fiber samples for electron-microscope studies. A. Frey-Wyssling & K. Mühlethaler, Pflanzenphysiologisches Inst. *Textile Research J. 17,* 32-3 (Jan. 1947).

Supersonic waves were found to give a better preparation of fiber samples than does the ball mill. A twisted bundle of fiber was held under slight tension immersed in water and exposed at a distance of 3-5 mm from the vibrator surface. This disintegrates ramie, flax, hemp, and cotton into fibrils which do not have a uniform diameter but taper at the ends into invisible microfibrils. The electron-microscope reveals a microfibrillar structure in which the fibrils appear to be further split into finer and finer strands, the smallest of which measure 60 Å in diameter. These may be termed micellar strands because they have the same diameter as the crystallized cellulose strands reported by x-ray analysis. The micellar strands are composed of about 100 cellulose chain molecules. There does not appear to be any definite unit particle or element of uniform size between the cellulose chain molecule as a chemical unit and the

fiber cell as a cytological unit. Fibrils, microfibrils and micellar strands are not natural units in the cell wall, but disintegration products of the plant fiber. The size of the fibrils, the microfibrils or even the micellar strand are dependent upon the method of disintegration of the coherent fiber texture. A number of photomicrographs of the disintegrated fibers are given.

TTD: 7-47

Filling power of feathers. Investigation of methods for determining filling power of feathers. Norman B. Edelman. Phila. QM. Depot. *Textile Research J. 17,* 199-206 (Apr. 1947).

Experience with water-fowl feathers indicated that compressibility, resilience, and warmth were related to filling power. Five different grades of feathers were treated as nearly alike as possible in washing, mixing, pounding, and testing. Several methods for determining filling power were tested, and it was concluded that the best method is one which uses a very small pressure on a large sample of feathers in a large container. This is designated the box method. The results are applicable only to feathers. TTD: 7-47

Hosiery reinforcement testing. Nylon leads in tests of hosiery reinforcement. H. Wignall. *Textile World 96,* No. 12, 137 (Dec. 1946).

The Goodbrand friction tester was used to test abrasion resistance of hosiery reinforcements. Samples of worsted hosiery, reinforced with linen, cotton, worsted, and nylon, were tested with the result that nylon was shown to be the best reinforcement. Description of the use of the tester and a chart of the results are given.

TTD: 7-47

Moisture relations of fibers. Equilibrium moisture relations for textile fibers. Richard K. Toner, Carol F. Bowen & John C. Whitwell, Textile Research Inst. & Princeton Univ. *Textile Research J. 17,* 7, 14-18 (Jan. 1947).

The experimental data of Wiegerink (*Textile Research 10,* 357 (1940)) for equilibrium moisture in relation to relative humidity were recalculated by the standard correlation method of Macarthy, Toner & Whitwell (*TTD:3,* 465). Sorption and desorption curves are given for clothing wool, carpet wool, raw silk, degummed silk, viscose, cuprammonium, and acetate rayon, raw cotton, purified cotton, and mercerized. There is also a desorption curve for soda-boiled cotton. It is believed that these curves represent the most probable values, but no other actual fiber will agree with them because of the effect of previous history. The results can be explained in terms of the physical chemical principles advanced by Whitwell and Toner (*TTD: 3,* 422).

TTD: 7-47

Moisture relations of fibers. Predicting equilibrium moisture relations with particular reference to textile fibers. John C. Whitwell & Richard K. Toner, Textile Research Inst. & Princeton Univ. *Textile Research J. 17,* 99-108 (Feb. 1947).

The extrapolation methods actually used in previous work (*see* previous abstract) are presented and the use of these extrapolation methods in forecasting a complete family of moisture equilibrium curves with very little experimental data is shown. TTD: 7-47

Protein fibers. Natural and synthetic protein fibers. Milton Harris & Alfred E. Brown, Harris Research Laboratories. *Textile Research J. 17,* 323-30 (June, 1947).

The structures of silk and wool are discussed in relation to their properties, and the substances are taken as patterns for the prediction of synthetic protein fibers. Preliminary consideration of the structure of available protein raw materials shows that the wool model structure could be more easily produced than the silk structure. To compare the mechanical properties of various fibers, load-elongation curves were determined by means of the Sookne-Harris Fiber Extensometer, a recent modification of an automatic, constant-rate-of-elongation apparatus previously described. (Sookne and Rutherford *J. Research, Natl. Bur. Standards 31,* 25 (1943)). Fibers 2" long were stretched at 0.2 in/min. to 20% of their original length and then allowed to contract at the same rate. Load-elongation curves were plotted which show a general similarity for conditioned wool and synthetic fibers when dry, but a decided difference when wet. This is attributed to the lack of sufficient effective cross links, and it is concluded that the development of synthetic protein fibers with mechanical properties comparable to those of wool must await the development of more effective cross-linking techniques. TTD: 7-47

Resilience of pile carpet. Notes on resilience of pile floor coverings. O. P. Beckwith & J. L. Barach, Alexander Smith & Sons Carpet Co. *Textile Research J. 17,* 305-13 (June, 1947).

The compressometer developed by Schiefer (*J. Research, Natl. Bur. Standards 10,* 705-13 (1933)) was used to determine the resilience of pile floor covering. The results indicated that the effect of a force on the pile is better expressed in terms of work done and work recovered than by the ratio of these 2 values, and that form factors play an important part in the resiliency or elasticity of the floor covering. Later, the carpeting was tacked to a plywood platform supported at its 4 corners by J-shaped brackets. Wire strain gages were attached to these brackets. The gages were all connected electrically in such a way that their outputs were added. A number of people walked on the carpet. Measure-

ments were made for walking on level floor and for climbing up and down stairs. The number of seconds required to complete the steps were averaged and tabulated. TTD: 7-47

Stress relaxation of cords. Stress relaxation of cotton and rayon cords at constant length. Edw. G. Burleigh & Helmut Wakeham, Southern Regional Research Laboratory. *Textile Research J. 17,* 245-55 (May, 1947).

Rapidly decaying stress in a strained cord held at constant length was measured as a function of time by using a strain gage on a metal weighbar attached to the cord. Results were obtained under different conditions of humidity and temperature and were used to evaluate the molecular constants of the Tobolsky-Eyring theory by assuming that the flow unit in the cellulose fiber consists of multiples of the cellobiose unit. From these constants, a theoretical tensile strength was calculated which agrees more closely with fact than values based on primary bond strength. This suggests that the mechanism of fiber breakage involves slippage of the cellulose chains with respect to each other. TTD: 7-47

Tear strength analysis. Analysis of tear strength. O. B. Hager, D. D. Gagliardi & H. B. Walker, Rohm & Haas Co. *Textile Research J. 17,* 376-81 (July, 1947).

The possibility of calculating tear strength from the usual breaking strength-extensibility data was investigated. An analysis of the factors involved in the ASTM tear test resulted in an equation which shows that tear strength is dependent principally on extensibility, breaking strength, effective specimen length of the threads, and the number of threads per inch. The correlation found between the calculated and measured tear strengths of the fabrics investigated indicates that this equation is essentially correct, giving results only slightly lower than the observed data. TTD: 7-47

Testing water repellency. Water repellency of textile fabrics. Anon. *Tech. News Bull. Natl. Bur. Standards 31,* 71 (June, 1947).

There is no single test to measure completely water repellency. Four tests, each measuring a different property, have been chosen to evaluate water repellency The effect of dry cleaning and laundering on water-repellent articles is examined by 3 different tests. TTD: 7-47

Uniform abrasion testing. Solution of problem of producing uniform abrasion and its application to testing of textiles. Herbert F. Schiefer. Natl. Bur. Standards. *Textile Research J. 17,* 360-8 (July, 1947).

A mathematical solution of the problem of finding the type of motion of the abradant and of the specimen which will produce uniform abrasion required that they be rotated in the same direction and at the same angular velocity. The specimen may revolve about the center of the abradant with any angular velocity, including 0, which is simplest motion; that is, the center of the specimen is at rest with respect to the center of the abradant. An abrasion machine designed to operate with this simplest motion was constructed and exploratory tests made on a variety of textiles. Uniform abrasion was obtained only when the two angular velocities were equal. A series of felts were tested and the decrease in thickness with the number of rotations found to be a promising method of measuring abrasion. Uniform abrasion was obtained even when the specimen was not uniform. TTD: 7-47

Water vapor permeability. Permeability of textile fabrics to water vapor. A. C. Goodings, Ontario Research Foundation. *Can. Chemistry & Process Industries 31,* 645 (July, 1947).

A method of measuring the resistance to the passage of water vapor through fabrics and similar materials of relatively high permeability is described. TTD: 7-47

Yarn abrader. Median as typical value for Walker yarn abrader data. Seaman J. Tanenhaus, Phila. QM. Depot. *Textile Research J. 17,* 281-6 (May, 1947).

Data representing the abrasion resistance of 6 lots of yarn, treated by various finishing processes, were chosen at random and plotted in the form of frequency distributions. The curves so obtained show the skewness of the distribution of the number of cycles required to produce yarn failure. The data were then plotted as cumulative frequency distributions on logarithmic probability paper as a convenient test of logarithmic normality; and straight lines were obtained in certain regions, indicating normality and validity of comparison within these limits. It is concluded that the best typical values representing quality levels of samples tested on the Walker yarn abrader is the average median of a number of sets of yarn, selected at random. TTD: 7-47

Yarn friction. Apparatus for determining the coefficient of friction of running yarn. Francis Breazeale, American Enka Corp. *Textile Research J. 17,* 27-31 (Jan. 1947).

An apparatus was constructed which, with certain auxiliary equipment, allows the coefficient of friction of yarn against various materials to be read directly from a scale. The indicated value is not affected by the tension of the yarn or the speed of the yarn travel except in those cases in which these variables actually change the value of the

coefficient of friction itself. The results may be used for the evaluation of various finishes as yarn lubricators, and for the design of guides and tension devices to give specified tension changes in a running thread. Some typical results are shown graphically. TTD: 7-47

Water vapor diffusion. Diffusion of water vapor through textiles. Lyman Fourt & Milton Harris, Harris Research Laboratories. *Textile Research J. 17,* 256-63 (May, 1947).

The fabrics were sealed with wax between metal rings and, in the absorption cup method, this assembly was sealed to a small dish containing a granular drying agent. The dishes were inverted so that the desiccant was in contact with the fiber and placed in a uniform current of conditioned air. Weights were determined at uniform intervals. In the evaporation procedure, the cloth-ring assembly was sealed into a crystallizing dish containing water. The dishes were then exposed to a uniform air current and weighed at intervals of about 1 hr. There was little difference in the results obtained by the 2 methods. With cotton, viscose rayon, and wool, the tightest weaves gave resistances only 4-8 times that of air, compared with 2-4 times the resistance to air for ordinary weaves. This indicates that significant amounts of water vapor travel through the fibers. The significance of these results in relation to the choice of clothing is discussed. TTD: 7-47

Static accumulator test. Ralph V. Ott (to Celanese Corp. of Am.). USP 2 421 430, June 3, 1947.

A testing device provides a plate of metal or other material which is mechanically rotated against a sample of textile fibers at constant pressure. After rotation for a definite time the plate is stopped, contact between the plate and the fibers is broken and the accumulated static electrical charge on the plate is measured by suitable electronic equipment.
SPH TTD: 7-47

Fabric abrading tester. Robt. L. Hood (to Am. Cyanamid Co.). USP 2 423 704, July 8, 1947.

An attachment to a standard abrading machine, similar to the Tabor Abrader or the like, consists of a hook which rests lightly on the sample. Upon failure of the sample the hook catches in the hole provided. Rotation of the table moves the hook in such a way as to operate a switch which stops the machine.
SPH TTD: 7-47

WATER-VAPOR PERMEABILITY APPARATUS. Frederick T. Carson & Vernon Worthington. Natl. Bur. Standards Circular C453; 1946; 18 pp.; price 10¢. May be obtained from Supt. of Documents, Government Printing Office, Washington, D. C. TTD: 7-47

TEXTILE MILLS X

European textile industry. Status of European textile industry as seen from Switzerland. E. Honnegger, Swiss Federal Inst. of Technology. *Textile Forum 4,* No. 2, 18-25 (Summer, 1947).

Some recent developments in Swiss textile machinery are described. These include improvements in ring spinning frames, automatic weft pirn winders, warping machines, special sizing machines, and new loom designs. The Sulzer weaving machine is described and it was concluded that this machine is very well suited for inserting weft of various filling colors and could replace a multiple-box loom. Helenca yarns are made of ordinary rayon by first giving it an exceedingly high twist on a ring doubling machine in one sense, say Z, treating with steam and formaldehyde at high temperature, dyeing with true colors, and then untwisting the yarn and giving it a small twist in the S sense. The product is voluminous, looks and feels like wool, has a low thermal conductivity, and absorbs little moisture. Other finishes are also discussed. (*Cf.* TTD: *4,* 97.) TTD: 7-47

Knitting-wool mill. Knitting wool spinners build new factory at Darlington. Anon. *Textile Recorder 64,* No. 767, 58, 61 (Feb. 1947).

A new plant (Patons and Baldwins, Ltd.) is briefly described as to construction and layout. TTD: 7-47

1946 DIRECTORY NUMBER, LINENS AND DOMESTICS, 32, NUMBER 4A. Haire Publishing Co., New York, N. Y.; 1946; 194 pp.; price $1.00.

Reviewed in *Textile Research J. 17,* 36 (Jan. 1947). TTD: 7-47

Buildings, machinery, power X 1

Chromium plating. Life of parts lengthened by chrome plating. D. B. McPherson. *Textile World 96,* No. 12, 139, 141, 206, 208 (Dec. 1946).

The use of chromium as a plating for textile machinery is discussed. Chromium is one of the hardest metals in commercial use and is an ideal combatant for wear and abrasion as well as corrosion. Printing rolls, drying cans, spinning frames, and the like are excellent examples of machinery that, when chromium plated, give better wear and produce a real economy. TTD: 7-47

Electric motors. Keep your own electric motors running smoothly. Ernest W. Fair. *Textile Age 10,* No. 12, 66, 68 (Dec. 1946).

Suggestions for routine servicing of electric motors and minor repairs, such as sand-papering a dirty commutator, are briefly noted. TTD: 7-47

Knitting plant. Modern tricot plant begins operation. Anon. *Textile World 97,* No. 1, 124-5, 127 (Jan. 1947).

Description is given of the Hornwood Warp Knitting Co. which produces tricot fabrics exclusively. The building is completely windowless, air conditioned, and fluorescent lighted. TTD: 7-47

Lubrication. Lubrication of textile mill equipment. J. H. Hooten, Gulf Oil Corp. *Textile Forum 4,* No. 2, 8-9, 38-42 (Summer, 1947).

The lubrication of opening, cleaning, picking, carding, drawing, roving, spinning, spooling, warping, winding, slashing, warp tying, weaving, dyeing, bleaching and finishing machinery is discussed. Attempts to prepare lubrication charts to cover the average textile plant have not been successful because of the various operating conditions. Even when the equipment is identical, it is always more satisfactory to survey the requirements of each individual plant. TTD: 7-47

Machinery lubrication. Centralized lubrication of machinery shows advantages. Chas. P. Willis. *Textile Age 11,* No. 2, 46, 50, 55-6 (Feb. 1947).

Bearing lubrication by a centralized system is discussed with the aid of diagrams. The advantages of time saving, reduction of waste, greater cleanliness, and reduced hazards are factors which favor this system over hand lubrication. TTD: 7-47

Mill power. Splashproof motors, spray-cooling, feed water conditioning, contaminated steam. Anon. *Silk & Rayon 20,* 1254 (Oct. 1946).

A brief review of maintenance problems. TTD: 7-47

Oil-fired boilers. Oil firing for Lancashire boilers. Chas. F. Wade. *Textile Recorder 64,* No. 767, 55-7 (Feb. 1947).

Some practical and theoretical considerations involved in converting boiler plants from coal to oil firing are briefly considered. TTD: 7-47

Textile machinery. Engineering outlook. XI. Anon. *Engineering 163,* 246-7 (Mar. 28, 1947).

The greatest problem of the textile machinery industry in England is that of increasing output rapidly enough to meet huge arrears of demand. Delivery for home consumption and abroad is discussed, and labor requirements are estimated. TTD: 7-47

Viscose rayon plant. Electrical installation in viscose rayon factory. C. F. Freeman & H. V. Mather. *Engineering 163,* 470 (June 6, 1947).

Electrical installations now used in typical factories

are described with special reference to difficulties and weaknesses to be overcome. TTD: 7-47

Power distribution. Bus duct provides flexible modern power distribution. Geo. Ransom. *Textile Age 11,* No. 1, 72, 74, 76-7 (Jan. 1947).

Installation of bus duct distribution systems is briefly discussed. Advantages of such an installation include: ease of installing with comparatively little labor, practically 100% salvageability, and provision for plug-in type breakers (permitting flexibility in arranging machinery such as twisting and weaving). TTD: 7-47

Steam load controls. Installs combustion controls to handle varying steam loads. Anon. *Textile Age 10,* No. 12, 70, 74, 76 (Dec. 1946).

Fluctuations in steam load are more efficiently handled by installation of an automatic combustion control applied to a spreader type stoker, briefly described and illustrated. TTD: 7-47

Water heating system. High-temperature water is efficient heat carrier. Victor L. Freeman, Am. Hydrotherm Corp. *Textile World 97,* No. 1, 129, 214 (Jan. 1947).

The use of high-temperature water (or other fluids) to replace steam heating is simpler than that of steam, and there are savings in heat losses, lower maintenance, and the like. TTD: 7-47

Lighting and air — X 2

Air conditioning. Air recirculation from exhaust system. John M. Kane. *Heating & Ventilating 44,* No. 4, 75-7 (Apr. 1947).

Both sides of the question of recirculation of exhaust in a dust control system are discussed. Exhaust ventilation for the collection of lint fly from such textile operations as cards, spinning frames, and looms will involve very large volumes because of the number of machines operated per unit of floor area. The practicability of improved working conditions in such plants may be entirely dependent on the return of cleaned air to the workroom. TTD: 7-47

Air conditioning. Evaporative cooling for textile mills. G. T. Lang. *Heating & Ventilating 42,* No. 12, 89-94 (Dec. 1945).

Argentine and North American practices are discussed and compared, particularly as to optimum mill conditions for cotton, rayon, and wool. Evaporative cooling equipment is briefly described. TTD: 7-47

Electrostatic air cleaning. Electrostatic air cleaning saves losses in many mills. Geo. Ransom. *Textile Age 10,* No. 12, 50, 52, 54 (Dec. 1946).

Electrostatic air cleaning has demonstrated its advantages in reducing waste, a typical installation being cited as an example. TTD: 7-47

Fluorescent lighting. Getting most from fluorescent lighting. Saml. H. Eaton, Sylvania Electric Products, Inc. *Textile World 96,* No. 12, 116-17 (Dec. 1946).

Proper maintenance of a fluorescent lighting system is important in preventing light loss due to dirty fixtures, dusty walls and ceilings, and over-age lamps. Electrical contractor-service is used in many mills to do regular inspecting, cleaning, and repairing. TTD: 7-47

Refrigeration in mills. Refrigeration for textile mill air conditioning. P. L. Davidson. *Heating & Ventilating 44,* No. 5, 57-62 (May, 1947).

This study of the best methods of humidifying and cooling textile mills is based on an investigation of the requirements for a group of textile mills and covers detailed analysis of refrigeration requirements for 2 comparable systems. TTD: 7-47

Wastes X 3

Wool scouring wastes. Hypochlorite process for treatment of wool scouring wastes and for recovery of wool grease. Harry A. Faber, Chlorine Inst. Inc. *Sewage Works J. 19,* 248-57 (Mar. 1947); discussion by Jos. L. Campanella, Fields Point Mfg. Corp.

Difficulties encountered in years past in treating scouring wastes and various treatments employed to neutralize the wastes and to recover the grease (in particular the acid cracking, the centrifugal, and the chlorine treatments) are briefly reviewed. The hypochlorite process (for which patent application has been made by Fields Point Mfg. Corp.) consists essentially of adding calcium hypochlorite solution to the waste in a continuous-flow mixing and aerating unit in an amount (in terms of Cl) approximately equal to the amount of alkali used in the scouring operation. Insoluble soaps and $CaCO_3$ are precipitated and the treated waste then discharged to settling tanks; after settling (for 8 hrs.) the supernatant liquor is decanted and discharged. By this process about 98% of the grease can be removed from the waste and about 70-75% can be recovered and sold. The economics of recovery are illustrated by examples. TTD: 7-47

Hazards; operations; efficiency X 4

Cotton flow chart. Cotton flow chart. Anon. *Textile World 97,* No. 1, 101-20 (Jan. 1947).

Flow chart of the cotton-system mill, including the processes from bale to finished cloth. TTD: 7-47

Garment worker's test. Aptitude tester for garment workers. E. C. Halliday, F. Anderson & E. O. Garnett, Council for Scientific and Industrial Research, Union of South Africa. *Electronics 20,* No. 9, 90-2 (Sept. 1947).

A machine whose operation requires coordination of hand and foot, which tests the ability of a garment worker in handling a sewing machine, is described and its arrangement and the circuit of its photoelectric amplifier diagrammed. In this machine, a wavy line is moved toward the subject at a speed which is controlled by him with a foot pedal. The subject tries to keep a pointer in contact with this line, and a clock automatically records all time intervals when the pointer is not in contact. TTD: 7-47

Insurance. Insurance in textile industry. Thos. Hollis, Liberty Mutual Insurance Co. *Textile Forum 4,* No. 2, 14-15, 34-5 (Summer, 1947).

This article sketches briefly most of the coverages needed to give complete protection. TTD: 7-47

Materials handling. Materials handling costs. C. Mallard Bowden, Textile World. *Textile World 97,* No. 1, 121-3, 200, 201 (Jan. 1947).

The need for improvements in interprocess and process handling in mills is discussed, and statistics shown in a mill-wide analysis of materials handling costs. TTD: 7-47

Materials handling. Mechanical handling saves money and labor. P. M. Thomas, Textile World. *Textile World 96,* No. 12, 118-21 (Dec. 1946).

The materials handling program at Avondale Mills is described with the aid of diagrams of mechanical handling devices. In order to make jobs easier and reduce the cost of processes, the mills are attempting to elimiate dumping, lifting, and the like wherever possible, and to increase productive jobs by decreasing nonproductive ones. TTD: 7-47

Textile financing. Bank financing for textiles. G. P. Geoghegan, Jr. Wachovia Bank & Trust Co. *Textile Forum 4,* No. 2, 10-11, 37 (Summer, 1947).

The various considerations which affect the bank credit of the textile producer are discussed. The bank will always inquire about the mill's research facilities, or whether it is using the facilities of commercial testing laboratories, textile school laboratories, and the various research institutes. TTD: 7-47

Fabric handling frame. Edwin G. Hellyar. Can. P. 440 615, Apr. 8, 1947.

See USP 2 356 787, Aug. 29, 1944 (TTD: *1,* No. 4, p. 8). TTD: 7-47

BASIC SCIENCES XI

Gases in elastomers. Solubility of gases in elastomers. R. M. Barrer. *Trans. Faraday Soc. 43,* 3-11 (Jan.-Feb. 1947).

A satisfactory sorption isotherm was derived for permanent gases in elastomers, based on the statistical thermodynamics of monomer-polymer mixtures and was used to compare the experimental and theoretical solubility constants of several permanent gases in various elastomers. The isotherms of a number of vapors in rubber were also calculated. TTD: 7-47

Phase contrast microscopy. The phase-contrast method and its applications in microscopy. A. Köhler & W. Loos. *Textile Research J. 17,* 82-95 (Feb. 1947).

The theoretical basis of this method and the fundamental differences between bright field and dark field and between positive and negative phase-contrast are discussed. In many cases the new method furnishes images more like the object than do the older methods. Unstained, even living, microscopic preparations can be observed and photographed in a particularly successful manner and with a clarity not hitherto regarded as possible. TTD: 7-47

Phase microscopy. Application of phase microscopy to textile fiber research. H. Reumuth, I. G. Farbenindustrie A-G. *Textile Research J. 17,* 69-81 (Feb. 1947).

The phase microscope shows that the fibrilla, formerly regarded as the basic structure of wool, is composed of a reticulated system of subfibrillae, and it is possible to recognize fine detail without resorting to swelling or staining thin sections. Likewise, in mycological studies of textiles, staining is obviated. The phase microscope is also useful in studying thickening paste used for printing fabrics, and for detecting particles of silicates imbedded in fabrics by repeated washings with detergents containing silicates. It reveals that there is no homogeneity of synthetic fibers or regenerated cellulosic fibers, regardless of the spinning process employed, and that the surfaces of these fibers are disintegrated by washing. TTD: 7-47

Polymer solutions. Statistical treatment of polymer solutions at infinite dilution. W. J. C. Orr. *Trans. Faraday Soc. 43,* 12-27 (Jan.-Feb. 1947).

The behavior of polymer solutions at very high dilution is treated statistically in terms of a generalized quasi-crystalline model in which account is taken of the special case of infinite dilution where the polymer molecules separate out as individual species. TTD: 7-47

Starch. Starches and starch fractions. I. Determination of dextrose and maltose by the ferricyanide-carbonate reagent, with special reference to effect of inorganic salts. L. H. Lampitt, C. H. F. Fuller, N. Goldenberg & G. H. Green; II. Determination of starch by hydrolysis with hydrochloric acid. L. H. Lampitt, C. H. F. Fuller & N. Goldenberg. *J. Soc. Chem. Industry 66,* 68-73, 117-21 (Mar., Apr. 1947).

The method of Hagedorn and Jensen for determining the reducing values of small amounts of reducing sugars was applied to the determination of dextrose from the acid hydrolysis of starch and maltose from the action of beta amylase on starch. It was found that the oxidative power of the ferricyanide-carbonate reagent toward dextrose and maltose is lowered by exposure to diffused daylight and by prolonged storage in the dark, and is also decreased by NaCl and sodium acetate in amounts such as would be present after hydrolyzing the starch with HCl or with beta-amylase in the presence of an acetic acid-sodium acetate buffer. In the starch hydrolysis by *N*-HCl at 100°C, 2 reactions take place from the commencement of heating: (1) a rapid hydrolysis of starch to dextrose and (2) a much slower decomposition of the dextrose by the hot acid. This decomposition is accompanied by an over-all loss in reducing power over the period of 1-12 hrs., the % loss being directly proportional to the time of heating. After correcting for the dextrose destroyed, the starch was shown to be quantitatively converted to dextrose on direct acid hydrolysis according to the stoichiometric relationship: 90 wt. parts starch equal to 100 wt. parts dextrose. This technique may be used to study the effectiveness of any particular set of conditions for the acid hydrolysis of starch and other similar polysaccharides to their component sugars. TTD: 7-47

Stretched cellulose. Relaxation effects in stretched cellulose model filaments. J. J. Hermans & D. Vermaas. *Rec. trav. chim. 65,* 625-7 (Sept. 1946).

If cellulose model filaments are stretched at a moderate rate and then kept at constant length, the retractive force relaxes to a finite value, which is roughly ½ of the initial force at the moment relaxation sets in. Highly swollen fresh cellulose model filaments, kept at constant length after stretching, show an increase in double refraction and decrease in degree of swelling in time. Reswollen filaments exhibit a decrease in double refraction at relatively low stretch and an increase at high elongation, the degree of swelling remaining constant in the former case and decreasing in the latter. TTD: 7-47

Swelling. On swelling. E. H. Buckner. *Rec. trav. chim. 65,* 616-19 (Sept. 1946).

The existing theories of swelling are briefly discussed. A new conception of its mechanism is proposed.

TTD: 7-47

ADVANCES IN CARBOHYDRATE CHEMISTRY. I. W. W. Pigman & M. L. Wolfrom, editors. Academic Press, Inc., New York, N. Y., 1945; 386 pp.; price $6.60.

Reviewed in *Textile Research J. 17,* 340 (June, 1947).

TTD: 7-47

ELASTIC AND CREEP PROPERTIES OF FILAMENTOUS MATERIALS AND OTHER HIGH POLYMERS. Herbert Leaderman; Textile Foundation, Washington, D. C.; 1944; 278 pp. (mimeographed).

Reviewed in *J. Phys. & Colloid Chemistry 51,* 886 (May, 1947).

TTD: 7-47

TEXTILE RESEARCH XII

American textile industry. American textile industry. F. C. Toy, British Cotton Industry Research Assn. *Textile Mfr. 72,* 580-2 (Nov. 1946).

A survey of the industry, made on a recent U. S. tour, is briefly summarized.

TTD: 7-47

Canvas goods. Better cotton textiles for better canvas goods selling. Chas. K. Everett, Cotton Textile Inst. *Natl. Canvas Goods Mfrs. Rev. 22,* No. 9, 19-20, 22 (Dec. 1946).

A brief general survey.

TTD: 7-47

Indian textile industry. Textile industry in India. A. M. Chaudhri. *Textile J. Australia 21,* 773-4 (Jan. 1947).

A brief review.

TTD: 7-47

Indian textile industry. Reorganization of textile industry. K. L. Govil. *Indian Textile J. 57,* 208-11 (Dec. 1946).

The dependence of India upon foreign machinery for its textile industry is emphasized. It is pointed out that the labor cost per pound of yarn (of average count 16s) in a Bombay mill exceeds that in a Japanese mill by over 60%, the labor cost per loom per day on grey cloth being more than 3 times the cost in a Japanese mill. Attention is called to the importance of the handloom industry, which supplies about 30% of requirements in India.

TTD: 7-47

Research. Research and the smaller firm. F. C. Toy, British Cotton Industry Research Assn. & C. G. Renold, Renold & Coventry Chain Co., Ltd. *Textile Mfr. 72,* 565-8 (Nov. 1946).

Suggestions are given on research facilities and the internal organization of the research department.

TTD: 7-47

Russia and textiles. Russia and textiles. H. C. Kershaw. *Textile Recorder 64,* No. 766, 62 (Jan. 1947).

Cotton research institutes, established in all the main growing areas of Russia, have not only increased the yields (2 1/2 bales per acre in 1945), but have produced longer staples (up to 2 1/2" in 1945). Colored cotton produced is sometimes superior to American and Egyptian cotton in quality and yield.

TTD: 7-47

Swedish Textile Research Institute. Swedish Textile Research Institute. Sven Hultin, Nils Gralen & Melchior Wernstedt. *Proc. Swed. Inst. Textile Research* No. 1, 5-51 (1946); *in Swedish.*

The organization, function, and purposes of the Institute are presented in some detail along with diagrams of floor plans of the buildings.

TTD: 7-47

Textile chemistry. 25 years of textile chemistry and its application. C. W. Bendigo, Textile World. *Textile World 96,* No. 12, 101-3 (Dec. 1946).

On the occasion of its 25th anniversary, the contributions of the AATCC to the textile industry are briefly surveyed.

TTD: 7-47

Textile manufacture. Textile manufacture—second southern industry. Caldwell R. Walker. *Mfrs'. Record 116,* No. 4, 29, 62, 64 (Apr. 1947).

The growth of the southern textile industry is briefly surveyed.

LCL

TTD: 7-47

Textile research. How Aspinook Corp. has organized its control and research laboratories. Anon. *Textile Age 11,* No. 2, 25-6, 38, 30, 32 (Feb. 1947).

Control and research laboratories are shown to be of definite importance to the finishing industry. By close control, mistakes are avoided and information becomes available for use in future problems. Research is being conducted in new printing techniques, fabric treatments fire- and abrasion-resistant coated fabrics, and new permanent finishes.

TTD: 7-47

Textile research. Research must be applied is theme of TRI meeting. Anon. *Textile World 96,* No. 12, 149, 220, 222 (Dec. 1946).

A discussion of the Textile Research Institute meeting. The need for applying research to practical applications in mills is stressed.

TTD: 7-47

Textile research. Textile research shows rapid growth. Jos. V. Sherman. *Textile World 97,* No. 1, 135, 204, 206, 210 (Jan. 1947).

Textile research companies have increased 58% since 1940, but the work is not evenly distributed. More research is being done on rayon and man-made fibers than on the natural ones. There has also been an increase in the research on chemicals, coatings, and unwoven fabrics. TTD: 7-47

Textiles. Introduction to textiles—I. W. G. Byerley. *Textile J. Australia 21,* 691-5 (Dec. 1946).

A simple, nontechnical explanation of the various types of fibers, both natural and manmade, is presented and intended as an introduction to a general consideration of the subject for the student, retailer, wholesaler, and consumer. The necessary and desirable properties in a fiber are discussed, the properties of various specific fibers being mentioned by way of example.
ELW TTD: 7-47

Work study. Work study in cotton industry. W. A. Grierson, Greenhalgh & Shaw, Ltd. *Textile Mfr. 72,* 570-1 (Nov. 1946).

Method study and time study are 2 phases of work study which should be made in order to promote the contentment of workers, reduce production costs and thereby increase earnings. TTD: 7-47

ECONOMICS OF COTTON TEXTILE INDUSTRY. Jules Backman & M. R. Gainsbrugh, New York; Natl. Industrial Conference Board; 1946; 207 pp.; price $1.50.

Reviewed in *Textile Research J. 17,* 35-6 (Jan. 1947). TTD: 7-47

SALES PROMOTION IN TEXTILE INDUSTRY. Jas. C. Cumming. Fairchild Publishing Co., New York; 1946; 132 pp.; price $3.00.

Reviewed in *Textile Research J. 17,* 342 (June, 1947). TTD: 7-47

STANDARD HANDBOOK OF TEXTILES. A. J. Hall, Natl. Trade Press, Ltd.

Reviewed in *Fibres 8,* 23 (Jan. 1947). TTD: 7-47